

Railway Age Gazette

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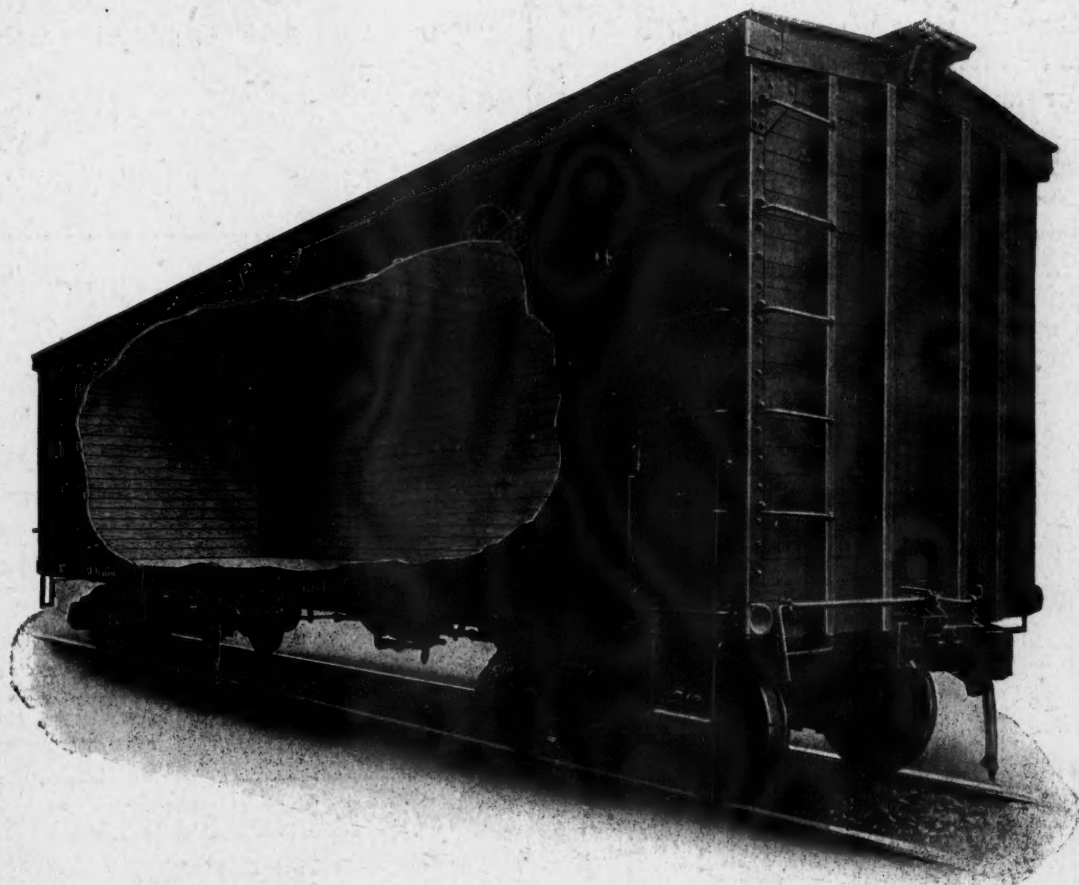
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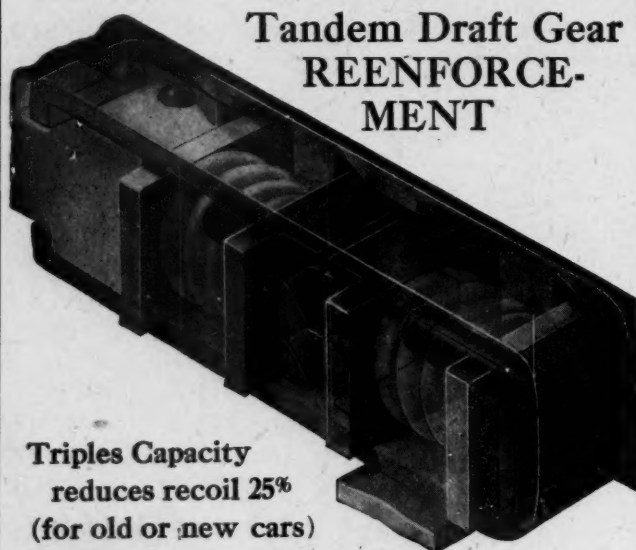
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Railway Age Gazette

Volume 61

September 1, 1916

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*Illustrated.

The indications are that the fiscal year ending June 30, 1916, will show the highest operating income for many roads of any year in their history. The highest peak in previous years will be for some roads 1913, for others 1910, but the fact that should be borne in mind in comparing the records which are now

Net Operating Income in 1916

being made with previous records is that not only must the operating income be compared, but the amount of additional investment in the property since the previous high record must also be taken into consideration. The Atchison, Topeka & Santa Fe earned an operating income—the amount available for interest, rentals, dividends and all other charges—of \$43,779,993 the year just ended. This is an increase over 1915 of \$7,728,593. The highest previous record for the Santa Fe was 1915, in which year the return on property investment was five per cent. The return on property investment for 1916 is 5.97 per cent; relatively, therefore, the 1916 fiscal year will apparently prove to be the best in the history of the property. Even so, less than 6 per cent is not an extravagantly high return on investment in a banner year. The Southern Railway in the fiscal year ended June 30, 1916, had an operating income of \$21,004,005. The balance after paying fixed charges was \$9,358,104; this compares with the best previous record, which was made in 1913, of \$7,078,625. The operating income of the Pennsylvania System, Lines East and West, was \$50,767,754, an increase over the corresponding six months of 1915 of \$21,959,004. The return earned on property investment for the entire system for the year ended June 30, 1916, was 6.90 per cent, comparing with 7.41 per cent for the year ended June 30, 1910.

The American Association of Railroad Superintendents' Committee on Interchange Car Inspection has emphasized

Encourage Your Car Inspectors

the necessity of giving more attention to the selection and training of car inspectors. Exceptional men are needed to meet the requirements of this position as roughly outlined by the committee. It is to be feared that far too little attention has been given to encouraging and inspiring these men to better

efforts, and that there has been too much of criticism and fault finding without constructive suggestions. To give the study which is required to master and keep up to date on the application of the complicated and extensive rules and regulations with which they must be familiar requires encouragement and active interest on the part of the supervising officers. Few men will respond with their best efforts if they are left to themselves or are only approached by their superiors when it is necessary to give them orders or criticize and discipline them. The possibilities of improved efficiency in transportation and savings in the cost of operation because of improved interchange and inspection service are surely sufficiently great to warrant responsible officers in the operating and car departments giving this problem more of their personal attention. A contributor to a recent number of the Railway Mechanical Engineer clearly developed this point in the following words: "Imagine how pleased an inspector would be to have the 'old man' come down to the car yard and thank him for a nice report or good inspection record. Do you know of any more profitable time spent than a little heart to heart talk by the superintendent of the car department with a number of inspectors, letting them know that by close attention and good work the company had saved money?"

In the crisp comments which Charles S. Mellen, former president of the New York, New Haven & Hartford, recently made on the Boston & Maine situation the following occurs:

Cost of Reproduction New

I do not put the blame of the proposed receivership on the leased lines. Some rentals were exorbitant, but rentals are not too high in most cases. It would be impossible to duplicate these roads at their cost to the Boston & Maine. Some could not be duplicated at 300 per cent of the present capitalization.

He predicts that if the receivership is carried to the bitter end it will result in breaking up the system, and although in the interview, a part of which is published elsewhere in this issue, he does not in so many words say that there is no prospect of separate parts of the system earning anywhere near a fair return on 300 per cent of their present capitalization, he strongly implies it; anyone who knows anything at all about the New England situation knows that this is the

fact and that most of the leased lines if operated by themselves would not be likely to earn even the present guaranteed return on their present capitalization. This throws a sidelight on the present return on what would be the cost of reproduction new of some of the main trunk lines in northern New England. Mr. Mellen blames the bankers in part for the Boston & Maine predicament. His own experience with the bankers was unfortunate, but in the main Mr. Mellen agrees with the opinions expressed in these columns last week, namely, that the fundamental trouble with the Boston & Maine has been that it has had necessarily to be financed by bonds instead of stock, and he implies that it would be far better in the long run if the Boston & Maine earned 10 per cent or more some years on a much larger stock capitalization than it now has if it had a smaller proportion of fixed charges.

THE COST OF WATER

THE cost of providing water for use in locomotives and stationary boilers necessarily differs on the various railroads. Water is more expensive in an arid territory than in a humid one, or in a district where deep wells are required than in one where river or sub-drainage water is available. Aside from the presence of these legitimate sources of difference in cost it is unfortunately true that the water supply department is not conducted as efficiently on some railroads as on others. This fact is appreciated only in a general way; no conclusive data are available to prove this, for in addition to physical conditions which make water more expensive on one road than on another, there are so many operating conditions which affect the relative water consumption that no unit has been discovered thus far which will correctly demonstrate relative efficiency in water service.

The difficulties encountered in investigations along this line are outlined on another page of this issue in an article which makes a comparison of water costs on several different bases.

A study of these results discloses the fact that each of the units suggested is inequitable under one or more conditions, being unfavorable, for example, to the road with the densest traffic or the heaviest grades or the greatest average trainload. Special sources of expense, such as the treatment of water containing excessive quantities of encrusting solids, provisions for prevention of freezing in cold climates or the use of track pans, also introduce factors that ought to be taken into account.

The cost of water in terms of the number of gallons of water pumped will not serve the purpose as it does not take into account the head, both gravity and friction, under which the plant or plants are compelled to work. On the other hand, the unit—gallons of water pumped against a one-foot head—will not meet the conditions, because the economical conduct of water service not only implies the efficient operation of existing plants, but also includes the elimination or replacement of the uneconomical pumping plants, the reduction of water waste and other items not represented by the quantity of water pumped.

The objections to such units as have been proposed up to the present time indicate clearly the difficulties to be encountered in a study of this problem. Notwithstanding these objections a unit which will permit of a fair comparison between the cost of providing water on different railways is highly desirable. The water required on the railways in this country costs more than \$16,000,000 annually. That this sum is not all being spent as efficiently as it might be is readily appreciated and the amount of money which can be saved by improved practices and proper supervision is surely large enough to justify not only the determination of a proper unit of cost, but a thorough study of the entire subject of water supply.

THE IMPENDING STRIKE

AT the time this editorial is being written, the United States is confronted with what may prove to be the greatest disaster in its history since the civil war. The labor brotherhoods have ordered a strike on all the railways effective on September 4, and the heads of the railways are unanimously standing firm for arbitration, and making all preparations for fighting the strike. The only agency which seems in a position to prevent the catastrophe is the national government, and thus far it has acted like a body that is paralyzed in all its members.

If the strike comes, who will be responsible for it? How long will it last? What will be the outcome? The second and third of these questions nobody can answer. The first is very easy to answer.

The movement among the train employees which is now about to reach its climax began almost a year ago. From the first the employees announced that they would not arbitrate their demands, but that unless the railways granted them in toto they would strike. The railways and the Chamber of Commerce of the United States repeatedly called the attention of Congress and President Wilson to the fact that an extremely dangerous situation was developing, but the President and Congress sat as still as knots on a log. Before the strike vote was taken the Conference Committee of the railways offered arbitration by the Interstate Commerce Commission or under the Newlands act. It renewed the offer after the strike vote was taken. When the matter got before President Wilson he suggested that the railways grant the so-called "eight-hour day" and defer indefinitely the consideration of other matters in controversy. He did not propose arbitration of the men's demand for time and a half for overtime. He did not propose arbitration of the demands of the railways. The employees accepted President Wilson's plan in its original form, but when later he asked them to agree to arbitrate their demands for time and a half for overtime and the demands of the railways they refused. The railways finally offered to submit the entire matter to arbitration by a commission to be appointed by President Wilson himself, but this suggestion received scant consideration from either the President or the employees. The President consulted Congress about the practicability of promptly getting legislation to deal with the situation, but Congress thought of the possible effect of legislation on the election next November, and stirred not. Not, at least, until the brotherhoods actually ordered a strike for September 4. Then, within six days of the date on which the strike was to occur, the President went to Congress and urged legislative action.

Manifestly, if a strike comes the railways will not be responsible, as they have exhausted every means at their command to secure a peaceable settlement, except complete surrender. The brotherhoods will have the primary responsibility, as they have refused all offers of a peaceable settlement which did not involve granting most of their demands. President Wilson will have to bear the secondary responsibility, because if he had stood for arbitration instead of trying to use the situation to serve his political purposes by declaring himself for an eight-hour day before the case had been presented to him, the chances are there never would have been any strike. Congress must bear the tertiary responsibility, because it has supinely refused to act until apparently it has become too late for any action it may take to do any good.

How long the strike will last is purely conjectural. The prospects are that it will be so gigantic that even our present cowardly, inert and politically-minded government will be forced to do something to bring it to a speedy end.

As to the outcome, one result seems certain. This is, that the strike will lead to legislation that will forever make it practically impossible for the nation's peace and welfare to

be jeopardized in this manner. This is one of the great advantages which, it would seem, must be gained from the determined stand for arbitration which the railways have taken. If they had yielded the nation would have believed that there really never was serious danger, after all, and the country would have continued to be menaced every two or three years by a similar crisis. If a strike comes, the nation will be brought to a full realization of the unscrupulous, desperate and ruthless character of the leadership of the railway brotherhoods, and will take steps to protect itself in future. The threat of force made by these organizations had to be squarely met some time, and the railways were right in deciding that this was the time to meet it.

If the strike comes, it would seem that it must mean the defeat of President Wilson and the Democratic party in November. The course of the President and Congress in dealing with the situation had been up to the time this editorial was written, a long and unbroken series of the most amazing blunders every one of which has contributed directly toward increasing the dangers of the situation. Even if the strike shall yet be prevented, the way the administration has acted must do it great harm. If it gets what will be in effect a compulsory arbitration law, it will enrage the railway brotherhoods. If it gets an eight-hour day law, it will further infuriate the business interests of the country. No matter what it does now it will be blamed by the public for having jumped into a bad situation and by its ill-considered measures made it ten-fold worse.

WAS IT A POLITICAL "FRAME-UP"?

THE nation naturally continues to ask itself what could have caused President Wilson to adopt so extraordinary and unprecedented a course in dealing with the railway wage question. What is back of it? Why did he propose and insist that, without any public investigation of the questions involved, the railways should grant increases in wages amounting to many millions of dollars to men who are already the highest paid working men in America? The burden will ultimately be passed on to the consuming public. Why has the President so strongly favored putting such a burden on the consuming public without giving that public any chance, directly or indirectly, to be heard?

We do not intend to make any charges against Mr. Wilson. We do intend, however, to present a series of facts the knowledge of which has forced us to reach certain conclusions regarding his conduct, and which we are confident will cause most of those who are informed of them to draw from them the same conclusions that we have.

Some of the facts which we will present already have been published. Others have not been. It is those which have not been which are the most important in this connection, because without them the chain of circumstantial evidence is incomplete, while with them supplied it seems to be complete. The courts sometimes have held that circumstantial evidence may sometimes be more conclusive than direct evidence, because the witnesses who give direct testimony may lie while circumstances do not lie.

This controversy between the railways and the labor brotherhoods is not a new development. It began a year ago. It was already acute six months ago. When the brotherhoods announced they were going to demand a "basic eight-hour day" they began by saying they would not arbitrate, but would tie up all the transportation lines of the country if the companies did not concede what they wanted. The railways were determined to give them nothing without arbitration. It was therefore foreseen from the start by all close observers that the danger of a terrible strike was real and serious. The railways spared neither effort nor money to get this fact before the administration, Congress and the public. But the administration and Congress were apathetic.

Judge W. L. Chambers of the federal mediation and conciliation board even gave out statements to the effect that this body was watching developments and was confident there would be no strike.

The Chamber of Commerce of the United States, the greatest organization of business interests in the country, became concerned about the situation, and submitted to its members a resolution asking the President and Congress to cause an investigation of the entire wage situation by the Interstate Commerce Commission. Meantime, on April 9, meetings of members of the labor brotherhoods were held at St. Louis in which addresses were made by W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers, and W. G. Lee, president of the Brotherhood of Railroad Trainmen. At one of these meetings both Lee and Stone made the statement "that they were absolutely confident of winning out, but that *they were going to do a certain thing which only the presidents of the four brotherhoods knew about*, one that they did not propose to tell anyone what this was, but that *it would be the deciding factor in winning out in this fight*." The report of this meeting, containing the words quoted, has been in our possession four months. Until within the last two weeks we were never able to get a clue to the meaning of those words.

On June 10 the conferences between the representatives of the brotherhoods and the Conference Committee of the Railways began in New York. Disagreement resulted, and the railways offered arbitration either by the Interstate Commerce Commission or under the Newlands act. The employees refused both and went out to take a strike vote.

Meantime, the vote of the Chamber of Commerce of the United States was reported, and was found to be almost unanimous in favor of an investigation by the Interstate Commerce Commission. The Chamber of Commerce resolution was sent to President Wilson. He ignored it. It was presented in Congress. Chairman Adamson of the House Committee on Interstate and Foreign Commerce is a close political friend and supporter of President Wilson. On July 12 Mr. Adamson arose in his place and explained that he was opposed to the Chamber of Commerce resolution because he and Mr. Mann, the Republican leader, had "investigated to see whether there would be any strike. I will not say where we went," he added, "but we were assured by the representatives of the employees that there would be no walk out, and they did not mean to stop the wheels." Mr. Mann promptly denied he had talked with representatives of the employees. The strike vote was actually being taken; and yet representatives of the administration and leaders of the brotherhoods continued to give out statements that they were confident that there would be no strike. The spokesmen of the administration gave no reason for the faith that was in them. The spokesmen of the brotherhoods said they were sure there would be no strike *because the railways would yield*.

H. A. Wheeler, chairman of the Railroad Committee of the Chamber of Commerce of the United States, finally sent direct to President Wilson a long telegram pressing upon him the seriousness of the situation and urging action on the Chamber of Commerce resolution. This, apparently, was received at the White House in the same cool spirit as all other representations from the Chamber of Commerce on the subject.

Finally, the strike vote was finished. It was to be presented to the railways in New York on the morning of August 8. Two days before, on the evening of August 6, the brotherhoods held a public meeting in New York at which they were addressed by some more or less distinguished speakers. But the most marked success of the evening was a speech by Dudley Field Malone. And who is Mr. Malone? Well, good people, he was the *personal representative* of President Wilson at the inauguration of the President of

Cuba and, by President Wilson's appointment, he is now collector of the Port of New York. Mr. Malone also advocated the eight-hour day demand of the brotherhoods. When Malone's speech was read by railway officers there was considerable consternation among them. Did he express the views of the administration? The railway officers made one answer then which was creditable to the rectitude and fairness of President Wilson. They don't answer the same way now.

The next day was August 7. On that day a man in Washington who is usually well informed regarding what is going on behind the scenes in that city wrote a remarkable letter to a prominent business man in New York—remarkable because of the accuracy with which it forecast subsequent developments. A copy of this letter was handed to us on August 8, and we kept it to see how good a prophet the writer of it was. We quote from this letter as follows (all italics being ours):

"I believe there is an understanding between Gompers, head of the American Federation of Labor, and the Administration, that this strike which is threatened will not hurt the Administration. *I am further given to understand that Gompers has assured the President that an opportunity will be given him to make capital out of the difficulty.* This is to be done in this way: The men are to reject all compromise offers by the railroads; they are to look askance on the mediation offered by the Board of Mediation and Control (conciliation), *thus giving the President a chance to intervene personally and bring both sides to the White House.* The proposition which he will submit *will in all probability be accepted by the (labor) leaders, thus putting the onus of rejection of his services on the railroad men (officers).* If a commission is appointed under these circumstances it is easy to see how it will not be entirely friendly to the railroads."

Now, then, was the man who wrote that letter a prophet? He certainly was! (1) Gompers is supporting Wilson for re-election, and has been in close touch with both the White House and the labor brotherhoods. (2) The men did reject all offers made by the railways. (3) They did "look askance" at mediation and refused to join with the railways in asking for it. (4) They did give the President a chance to intervene personally and bring both sides to the White House. (5) The President did make a proposition which the labor leaders immediately accepted, thus putting the onus of rejection of his services entirely on the railroads.

But we are getting a little ahead of our story. The Chamber of Commerce of the United States had asked for an investigation by the Interstate Commerce Commission. The railways asked for this before the strike vote, and again during the mediation. President Wilson invited both sides to come to the White House, but on August 11, before doing this, he wrote a letter to the president of the Boston Chamber of Commerce, which was immediately published, opposing the submission of the matter to the Commission. In other words, he publicly rejected the railways' proposition before they had an opportunity to present it to him. Furthermore, he made a proposition indorsing the brotherhoods' demands for a "basic eight-hour day" in the very first stages of the conferences at the White House, and admitted he had decided to do so before the railway officers called on him. And on April 9 Messrs. Stone and Lee were saying in speeches in St. Louis that "they were absolutely confident of winning out, but that they were going to do a certain thing which only the presidents of the four organizations knew about, and that they did not propose to tell anyone what this was, but that *it would be the deciding factor in winning out in this fight!*" The last piece of evidence needed to establish the case was afforded by Chairman Adamson of the House Committee on Interstate Commerce after negotiations between President Wilson and the railway executives and managers had begun. On August 24 the Atlanta Constitution said regarding a conversation between its Washington correspondent and Mr.

Adamson which occurred on August 23: "Mr. Adamson said he had a conference *four months ago* with the President, and *a conclusion was reached as to his course at that time.*"

The President has acted throughout like a man who had entered into a previous understanding that he would do certain things and who was anxious to deliver the goods as promptly and in as good condition as possible. If he was playing politics, recent developments have been showing that he has been playing very poor politics. He has done nothing in his administration that has worked him as much harm as the policy he has adopted in dealing with the railway strike crisis.

NEW BOOKS

Mechanical Engineers' Handbook. Lionel S. Marks, professor of mechanical engineering, Harvard University and Massachusetts Institute of Technology, editor-in-chief. Bound in morocco. 1,836 pages. 4 1/4 in. by 7 in. Illustrated. Published by the McGraw-Hill Book Company, Inc., 239 West 39th street, New York. Price, \$5 net.

The field of mechanical engineering has become so extended that it is no longer possible for a single individual, or a small group of individuals, to have sufficiently intimate acquaintance with all its branches to permit a satisfactory exercise of critical judgment in the statement of current practice and the selection of engineering data. The only existing reference work for mechanical engineers, compiled by a large group of specialists, is the three-volume German book, "Hütte," now in its twenty-second edition. This book, however, includes civil and electrical engineering, as well as mechanical engineering. It has been continually improved for over fifty years, and is now the accepted authority within its range of topics. This work has been used as the basis for the new handbook. In only a few of the more theoretical sections, however, has the "Hütte" been followed at all closely. The greater part of the book, particularly those portions which deal with engineering practice, is wholly new.

The subject matter groups itself into two main divisions, the first 860 pages being devoted to the more theoretical topics and the last 960 pages to the statement and discussion of current practice. The first portion is divided into seven sections as follows: Mathematical Tables and Weights and Measures; Mathematics; Mechanics of Solids and Liquids (including Friction); Heat; Strength of Materials, Materials of Engineering; and Machine Elements. The portion treating of practice is divided into eight sections dealing with Power Generation; Hoisting and Conveying; Transportation; Building Construction and Equipment; Machine Shop Practice; Pumps and Compressors; and Engineering Measurements, Mechanical Refrigeration, etc. The total list of contributors numbers 50 specialists, each of whom is qualified to speak authoritatively on the subject assigned to him. In order to further increase the accuracy of data and to insure that the subject matter is not solely the practice of an individual, but is truly representative, a number of the contributions which deal with engineering practice were submitted by the editor-in-chief to one or more other specialists, for criticism before finally being incorporated as a part of the handbook.

This book is the most thorough and comprehensive mechanical engineers' handbook adapted to American practice, if not in the English language, and its usefulness is considerably enhanced by certain features of the make-up. Both the front and back end fly leaves contain an index to major topics and an index to the more important tables is given on the inside of each cover. The book is provided with thumb tabs so that the reader, after looking at the index on the fly leaf and finding there the section number, may turn immediately, by use of the thumb tabs, to the section in which he is interested. The index is unusually complete and well arranged.

Convention of Tool Foremen's Association

Annual Meeting Held Last Week in Chicago; Discussion of Heat Treatment of Steel, Special Tools, Etc.

THE eighth annual convention of the American Railway Tool Foremen's Association was held at the Hotel Sherman, Chicago, Ill., August 24 to 26 inclusive, J. J. Sheehan, tool foreman of the Norfolk & Western, presiding. Prayer was offered by Bishop Thomas Nicholson, and the convention was welcomed to the city by John D. Shoop, superintendent of Chicago schools. J. A. Carney, superintendent of shops of the Chicago, Burlington & Quincy at Aurora, addressed the convention. President Sheehan in his address of welcome said:

You have been called from your various roads for the purpose of reviewing the progress that has attended our efforts during the past year, as will be shown by the committee reports, and to gain new ideas from them and the discussions on the floor of the convention. That our association has filled its niche in the railroad field is evidenced by the many favorable comments and references that have come to my notice. This is gratifying, inasmuch as it proves there is a need for the work in which we are engaged and it should stimulate us to put our earnest efforts into that which we undertake. The association is in a healthy condition, both financially and in regard to increased membership.

ADDRESS BY MR. CARNEY

J. A. Carney, superintendent of shops, Chicago, Burlington & Quincy, addressed the convention in part as follows:

I do not want to take up your time in going into the details of how you should hold your file, the construction of tools and things of that sort that you all know more about than I do. What I want to touch on is not so much details as it is the matter of toolrooms in general. The function of a toolroom is to look after the tools which are used by the productive workers in the shop, whether it be a machine shop, a locomotive erecting shop, or a car shop. I have in mind one toolroom which is in charge of one man. He occupies a room about 10 ft. square and his sole duty is to repair cutters for bolt trimming machinery. I have in mind another toolroom that has more machinery in it than we have in the Aurora shops of the Burlington. These are the two limits.

The province of the toolroom is to make the tools that are needed, to maintain them in such a condition that when wanted they are ready to be given out, and to have them at hand so that there will be no delay to the men who call for them.

HEAT TREATMENT OF STEEL

Henry Otto, A. T. & S. F.: Whether annealing, hardening or tempering, each grade of steel has a definite temperature to which it should be heated in order that it will give the best results. This temperature will also vary according to the use to which the steel is to be put. Slight variations from this proper temperature may do irreparable damage to the steel.

Carbon Steel.—Carbon steel when not heated above 1,350 deg. will be in the annealed state and when heated from 1,350 to 1,500 deg. will be in a hardened state. When heated above 1,500 deg. it will be softer than the second case mentioned, although harder than the first. In the actual heating of a piece of steel several requirements are essential in order to obtain good hardening; first, the small projections or the cutting edges should not be heated more rapidly than is the body of the tool, and second, all parts of the tool should be heated to the same temperature. A tool heated uniformly to as low a temperature as will give the required hardness will produce the best results.

We heat all the tools made of carbon steel in lead pots, the temperature of which is recorded by pyrometers and maintained at the proper degree. To prevent the hot lead from sticking to the tool heated in it, the tool is painted with a mixture of common whiting and wood alcohol. These lead melting pots are made from 6 in. iron pipe and are reinforced with $\frac{3}{4}$ in. by 4 in. iron rings, the bottom being welded in. They will last when used every day for about three or four months. All tools made of carbon steel are quenched in pure water.

For tempering by the color method, temperatures corresponding to the different colors are given below:

Color.	Deg. Fahrenheit.	Color.	Deg. Fahrenheit.
Very pale yellow.....	430	Spotted red brown.....	510
Light yellow	440	A brown purple.....	520
Pale straw yellow.....	450	Light purple	530
Straw yellow	460	Full purple	540
Deep straw yellow.....	470	Dark purple	550
Dark yellow	480	Full blue	560
Yellow brown	490	Dark blue	570
Brown yellow	500		

The modern method of tempering is to heat the tools to the required temperature in a bath of molten lead, heated oil or other liquids. By this method it is possible to heat the work uniformly and to give a temperature close to the proper limit. At Topeka we use an electrically heated oil bath for tempering all carbon steel tools.

High Speed Steel.—Temperatures of from 1,800 to 2,200 deg. are required to harden high speed steel. The usual method of hardening or heat treating planing tools is to heat the cutting end slowly to a temperature of about 1,800 deg. and then more rapidly to 2,200 deg. or until the end is at a dazzling white heat and shows signs of melting. The point of the tool is then cooled either by plunging it in a bath of oil, such as linseed or cottonseed, or by placing the end of the tool in a blast of dry air. The exact treatment of high speed steel varies for the different kinds of steel, and it is advisable to follow closely the directions given by the steel makers.

Heavy high speed tools having well supported cutting edges, such as planer or turning tools, are commonly used after hardening without tempering. If the construction of the tool is such that the cutting edges are comparatively weak they are often toughened by tempering or what is sometimes called "letting down" the hardness. A method recommended by several steel makers is to cover the steel with clean, dry sand and heat it to the required temperature, which should be shown preferably by a pyrometer. Milling cutters are heated to 400 deg., drills and reamers to 440 deg., for the largest sizes, and 460 deg. for the smaller sizes.

In annealing high speed steel the steel should be packed in an iron box or pipe of sufficient size to allow at least $\frac{1}{2}$ in. of packing between the sides of the steel to be annealed and the sides of the box. It is not necessary that each piece of steel be kept separate from every other piece but it should be kept from touching the sides of the annealing box. It can be packed in powdered charcoal, fine dry lime or mica. The annealing box should be made air-tight and the whole thing heated slowly to a full red heat, about 1,475 deg. to 1,500 deg., and held at this heat from two to eight hours, depending upon the size of the pieces to be annealed. It should then be cooled slowly and not exposed to the air until cold.

E. A. Greame, D. L. & W.: The United States Bureau of Standards states that skilled observers vary as much as 100 deg. in the estimation of relatively low temperatures of steel by the color method and beyond 2,200 deg. it is practically impossible to estimate with any degree of certainty.

This would clearly indicate that the color method is not an accurate means to use for the determining of temperatures of steel. Steel can more properly be heat-treated and better results obtained when pyrometers are used. The importance of having proper equipment for the heat treating of steel cannot be overestimated. It is the cheapest equipment in the long run. Most failures in the treating of tool steel have been attributed to the steel but there can be hardly any question but that 90 per cent of the failures result from the lack of knowledge of the proper method of treatment.

A tool to give the proper degree of efficiency should be tempered to give the proper hardness and still have sufficient toughness for the work in which it is to be used. At the Scranton shops of the Delaware, Lackawanna & Western the scleroscope is used to determine the relative hardness of the steel. As a comparative measure of materials it is very accurate, rapid, simple and definite. It consists of a glass graduated tube with a small cylinder of steel which has a diamond point. This cylinder slides in a vertical direction in the tube and is allowed to fall upon a previously polished surface of the material to be tested. The height of the rebound of the cylinder is taken as the measure of the relative hardness. A pyrometer should be used to determine the proper heat treatment given for the steel. This instrument should be frequently tested to insure its accuracy. This can be done by testing with a standard pyrometer, or if low temperatures are used, by a standard mercury thermometer.

When rivet sets are to be hardened and a water hardening steel is used they should be dipped in the tank with shank down and running water directed into the cup of the tool. This treatment avoids the collection of hot water in the cup which would prevent the cup from properly hardening. We find that the vanadium alloy steel is most suitable for these tools.

To avoid cracking large spring dies when they are being hardened they are quenched in a tank of water and oil, the water being sufficiently deep to cover the threaded portions of the dies and the oil on top of the water covering the rest of the dies. By this treatment the threaded portion of the die is hardened while the body of the die is only toughened. The die can then be drawn by the usual method. Care should be taken, however, to give the die a constant circular movement.

All reamers and long slender tools should be heated in lead pots and quenched in the usual manner. This will tend to eliminate the scale on the surface and the warping of the tool. A mixture of two-thirds salt and one-third cyanide of potassium, heated to a red heat for one hour and allowed to cool and harden and then mixed in the lead bath, is a good method to prevent the lead from sticking to the threads and small projections of the tool. The top of the lead pot should be covered with bone black.

Owen D. Kinsey, formerly of the Illinois Central: To obtain maximum efficiency of tool steels the treatment of them must be scientifically handled. The skill of the most experienced operator is inadequate to obtain correct hardening and drawing temperature by observation. The material and labor entering into the manufacture of tools presents an enormous annual expense to every railway system. The high priced steels improperly heat treated increase the cost of manufacture, to say nothing of the delays in production in the shops on account of not properly serving their purpose. Without the use of a pyrometer in the heat treatment of high speed steel there is considerable danger in burning away the cutting edges or warping the tool out of shape.

More than likely the tool will not be brought up to the proper temperature for fear of overheating it, which will cause the workman considerable trouble when it gets to the shop. Then, again, the tool may break on account of the temper not being drawn sufficiently to relieve the strain. This is a matter that should be carefully studied as a tool properly

drawn will reduce tool breakage and the chipping away of the cutting edge. A drawing temperature of 450 deg. has been found to give the best results for high speed steel reamers, taps and milling cutters, and a much higher temperature is now being recommended by several of the large steel producers for large tools, such as for planers and other machines.

SPECIAL TOOLS FOR STEEL CAR REPAIRS

W. M. Robertson (Ill. Cent.): When steel freight cars were first introduced car department officers felt considerable anxiety relative to the facilities for maintaining them. It was soon found, however, that the problem was not nearly so troublesome as it first appeared to be. It is the tendency on most roads for the car foreman to rely upon his own resources in the provision of special tools, as he has met with but little consideration from the general tool room and the locomotive department. It seems to be the opinion of the locomotive department that on account of the rough nature of car repair work the requirements in this respect are slight, but the contrary is true; on account of the amount of this work handled it should be given very close consideration. Metal workers in the car department are not using jigs and the tools that were common in the locomotive department ten years ago because of the lack of co-operation among the foreman and the tool department. It seems to me that the tool foreman is the man who can best improve these conditions. [Mr. Robertson then described a number of special tools for use in steel car repairs which have been adopted at the Harahan, La., shops of the Illinois Central.]

J. W. Pike, Rock Island Lines, referred to a holder-on for use on the Boyer long stroke hammer. This device consists of a special head which replaces the usual type of handle on the end of the hammer barrel. In place of the handle the end of the head is fitted with a cylinder of 2½-in. Shelby steel tubing, in which works the mild steel holder-on piston. The length of the piston is increased as desired by a piece of 1¼-in. pipe. The head is fitted with two ⅜-in. air pipe connections, one for the holder-on cylinder and the other for the hammer proper.

E. J. McKernan presented a drawing of a jig for drilling brake staffs, which is used on the Santa Fe. This consists of a block of soft steel through which are holes for the brake staff; at right angles to these are holes bushed with tool steel for guiding the drills. This jig takes care of all the drilling operations on the staff.

RECLAIMING MATERIAL

E. J. McKernan, A., T. & S. F.: All tool steel on the Santa Fe system is reclaimed. The steel is first returned to our Topeka shop for a general inspection, after which such material as is considered serviceable is held in reserve to be made up into small tools as we deem necessary. The short pieces of high speed steel are made into tips for lathe and planer tools, the tips being gas welded to shanks of tire steel. The short ends of old lathe and planer tools are drawn out and made up into square tools for use in Armstrong holders. Only the small chips that are removed in dressing the tools at the blacksmith's anvil reach the scrap, and at this time there is a good market for this class of scrap steel.

All broken high speed twist drills and reamers are reclaimed whenever the pieces are large enough to make this possible, otherwise they are placed in the scrap. A special effort has been made to reclaim all of this steel, which has worked out very economically. Had such a system not been in effect at this time there would have been difficulty in operating all of our machines, due to the shortage of high speed steel. Large washout plug taps that have become slightly worn are returned to Topeka, where they are annealed and recut to the next smaller size. These taps are all kept to standard, the diameters varying in steps of ⅛ in. All chisels, whether for use by hand or in air hammers, are

made up into center punches when they become too short, the minimum safe length for regular service being four inches. Worn reamers are remilled and made to the nearest smaller size.

W. M. Robertson (Ill. Cent.): An air operated vise has proved to be a very useful arrangement for bolt work at the reclaiming plant. The operating mechanism usually consists of two 10-in. air brake cylinders which may be attached to an 8-in. bench vise by removing the hand operating screw. The latter is replaced by a long rod, to the end of which the two operating pistons are attached by means of an equalizer. It is not advisable to use a vise smaller than the 8-in. size because of the hard usage to which it is subjected. In connection with this we use a special air motor-operated arrangement for removing nuts from the old bolts. The motor is suspended over the vise with the spindle attached to an old flexible shaft used for driving tube cutters in the locomotive front end. When not in use the shaft may be swung out of the way to a bracket conveniently placed on the vise.

DISCUSSION

Mr. McKernan pointed out that it would not be considered economical to use the welded tools if it were possible to secure the high speed steel on the basis of the market existing before the war. The following statement shows the various items entering into the cost of a lot of 432 tools, ranging in size from $\frac{1}{2}$ in. by 1 in. by 8 in. to $1\frac{1}{4}$ in. by 2 in. by 14 in., which were made at the Topeka shops of the Santa Fe.

1,497 lb. tire steel	\$15.91
279 lb. high speed steel	164.03
105 lb. No. 2 welding rods	15.75
35 lb. Norway iron for facing the tips	4.35
Total material	\$221.24
Total cost, including labor and overhead	\$672.14

Better results have been obtained in the heat treatment of the tipped tools, owing to the smaller size of the piece of high speed steel to be hardened. On the Santa Fe both the oxy-acetylene and the electric welding processes have been tested and it has been found that the results of the former are more satisfactory. The quality of the high speed steel seems to be affected less by the former process.

On the Norfolk & Western the electric spot welding process is being used for this work. The adjoining surfaces of the tip and shank are corrugated and are cleaned before welding. The corrugations facilitate the quick heating of the surfaces by reducing the area of contact through which the current must pass at the beginning of the process. When the surfaces have fused, the tip and the shank are squeezed together and the weld made.

SPECIAL TOOLS FOR THE FORGE SHOP

George W. Smith, C. & O.: Hundreds of hand hammers have been made in dies under the steam hammer with very good results. A model is made out of open hearth steel on a lathe, and two dies are formed under the hammer. The blocks of the dies are provided with long handles which are connected at the end. The dies are brought up to the proper heat and the former made on the lathe is placed in the center of the dies under a steam hammer. The impressions in the dies are made in this manner, the former being revolved between the strokes of the hammer. The hammers are made in the dies from open hearth steel rods, a large number being turned out in a short space of time. The hammers having thus been formed are reheated and placed in a forging machine and the eye is punched and the sides flattened in one operation. The fins are ground off on an emery wheel. The hammer is then tempered. These are used for general rough work and are produced at a cost of from six to seven cents each, exclusive of the handles.

Scrapped tires are used for making shear blades, large

punches, and dies, the steel being cut to proper length by means of the oxy-acetylene cutting process.

Spring steel is used for making S-wrenches. A suitable die and punch are made to form the ends and enough stock is left in the center of the wrench to draw it out under the steam hammer to the required length. The ends are punched to the proper size for the nut, and the wrench is bent in a former.

GRINDING WHEELS AS APPLIED TO LOCOMOTIVE REPAIRS

H. B. Miller, Big Four: This subject includes the grinding of all tools or machines which are used in the repairing of locomotives. Successful grinding must start with the condition of the grinding machine, which must have properly fitted bearings and a proper range of speeds and feeds, and must be properly lubricated. The next consideration is the material which we are to grind. The character of this must be known in order that we may select a wheel of the proper grain, size and shape. Much time is saved in grinding by having the proper fixtures with which to do the work. In grinding ball reamers a device that can be moved from the center each way to take care of the radius, the movement being effected by means of a lever, has made it possible to use a ball joint where an angle was formerly used.

In different repair shops the system of handling tools must necessarily be adapted to the working conditions of the shop, but the grinding should be done in the tool room, the tools being placed in the checking room for distribution. As the tools are used and returned they should be checked over, re-ground and re-marked if necessary, after which they should be placed in the checking racks. An essential point in grinding tools is the provision of the proper degree of clearance for the work to be done by the tool. We find a difference in the cutting qualities of straight and spiral reamers with the same degree of clearance. In this case we are using a standard degree of clearance on each tool according to the work for which it is intended, as we have found that too much clearance and no clearance are equally worthless.

A. Sterner (C. R. I. & P.): Although the application of grinding to the finishing of piston rods and crank pins appears to be unlimited, experience seems to indicate that the old practice of turning and rolling is better. This is due to the fact that the tough material of these parts retains particles of the abrasive, the bad effects of which are very well known. Parts which do not have any severe work to do, and which are required to have a finished or semi-finished surface, should always be made with as little stock as possible and may be finished by grinding. Working surfaces should not be ground unless they are carbonized, chilled or tempered.

DISCUSSION

The question arose as to whether or not the grinding of piston rods and air compressor rods affected the life of the packing, especially where metallic packing was used, it being claimed that the grains from the grinding wheel would penetrate the pores of the steel rod and thus score the packing. It was claimed by the representatives of grinding wheel manufacturers who were present during this discussion that this was not true as has been repeatedly proved by tests. Where grinding wheels are used for this purpose, however, care must be taken to have them true to diameter with no high spots and they must be run at the proper speed. Some roads prefer rolling the rods to grinding them, claiming that a smoother surface can be obtained.

JIGS AND DEVICES FOR THE ENGINEHOUSE

A. Connell, Kansas City Southern: Until recently the use of special tools and jigs for doing the various kinds of work

in the roundhouse was unknown, with the exception of an occasional tool made by individual workmen. The back shop received all the attention, the workmen there having many useful special tools. Because of this condition the term "roundhouse job" was commonly used to indicate work that was half done or done just well enough to last one trip of the engine, and it was customary for men in the roundhouse to spend several times as long in doing their work without special tools as would have been required with them. Considerable credit is due the Tool Foremen's Association for the development of tools and jigs for the roundhouse.

DISCUSSION

Several of the members spoke strongly in favor of the tool foremen giving their best thought to devising special jigs and tools for use in the enginehouse, for the need of such things in the enginehouse is very great. Every means should be given the enginehouse force to make quick and thorough repairs, for then the power would be kept in service longer and would be able to make a greater mileage between shoppings, all of which means a more efficient mechanical department. It was designated as the "emergency hospital," for the locomotive and the "doctors" therein should be provided with satisfactory tools. The outlying enginehouses should be given even more assistance than those at or near the back shops, for at these points in case of emergency the proper equipment can be borrowed while the outlying enginehouse would have to either hold the engine for a much longer time or send it to the main shop.

OTHER BUSINESS

J. C. Bevelle, El Paso & Southwestern, read a paper on Tool Room Equipment and Tools. This included a number of illustrations.

The following officers were elected to serve for the ensuing year: President, C. A. Shaffer, Illinois Central, Chicago; first vice-president, J. C. Bevelle, El Paso & Southwestern, El Paso, Tex.; second vice-president, W. M. Robertson, Illinois Central, New Orleans, La.; third vice-president, J. B. Hasty, Atchison, Topeka & Santa Fe, San Bernardino, Cal.; secretary-treasurer, R. D. Fletcher, Belt Ry. of Chicago, Chicago; chairman of the executive committee, B. Hendrickson, Chicago & North Western, Chicago. The association voted to hold its next convention in Chicago.

WOODS USED BY THE RAILROADS*

By Howard F. Weiss

Director, Forest Products Laboratory, Madison, Wis.

There has existed for some time a rather common belief that our timber supply has become so scarce that it is now almost impossible to secure timber of good quality. This impression is quite misleading. The United States Department of Commerce estimates the amount of standing timber in the United States at approximately 2,900,000,000,000 ft. b. m.

The present total annual consumption of timber in this country approximates 52,000,000,000 ft. B. M., which would indicate that our present stands of virgin timber will last approximately 55 years if the rate of exploitation continues as at present. When we add to this the amount of timber being produced annually, due to new growth, it, of course, very materially lengthens the theoretical period of exhaustion. A consumer can secure just as good timber now as formerly, and, in view of the fact that we now have grading rules based upon accurate scientific data, a customer can

secure structural timber which will run even better than timber secured in years gone by when no such grading rules existed. Of course, the price of timber has advanced, just as has the price of many other products, and with the steady cutting of our virgin supply, it will undoubtedly continue to advance.

The improved conditions under which timber is now being used in the United States are making it possible to secure from it a much greater service than was secured in the past. This is excellently illustrated in the wooden cross-tie. Only a few years ago the number of ties impregnated with wood preservatives in this country was comparatively small, but within the last decade the percentage has very rapidly increased, and is continuing to do so. Thus by means of artificially prolonging the life of the natural wood, we are able not only to secure a much greater service from the woods originally used for ties, but it has been found possible to use for the manufacture of cross-ties many woods which were heretofore of little or no value. It is perhaps not far from the truth to say that the average life of untreated cross-ties in the United States is seven years, and that our total annual consumption of ties for renewal purposes alone is around 100,000,000. From the results which have been secured in prolonging the life of wooden ties from decay, there is every reason to expect that with proper treatment an average service of about 17 years can be secured. Should this prove to be true, it will more than cut in half our present annual consumption of cross-ties for replacement purposes.

About 9 per cent of our total annual consumption of 52,000,000,000 ft. B. M. of timber goes into the manufacture of ties, and about 2½ per cent is used in car construction. In addition to these two items, a very large amount of timber is used annually by the railroads in the construction of bridges, stations and other structures. For this reason I believe it would be good policy for them to insure for themselves a plentiful supply of suitable timbers tributary to their property by encouraging the farmers along their rights-of-way to cut and manage their woodlots along approved silvicultural lines, so that these small wooded patches scattered here and there will be made to produce a maximum amount of good timber in a minimum of time and expense. Of course, those railroads which depend on large operators for their supplies of ties are not so vitally concerned in this question.

Much improvement can undoubtedly be made in present methods of inspecting timbers for railroad consumption. In fact, present methods result in much needless confusion and waste. In an attempt to improve this condition, our laboratory has just prepared a bulletin called "The Tie Guide Book," which explains in simple language and with suitable pictures how the different kinds of timber cut for ties can be identified.

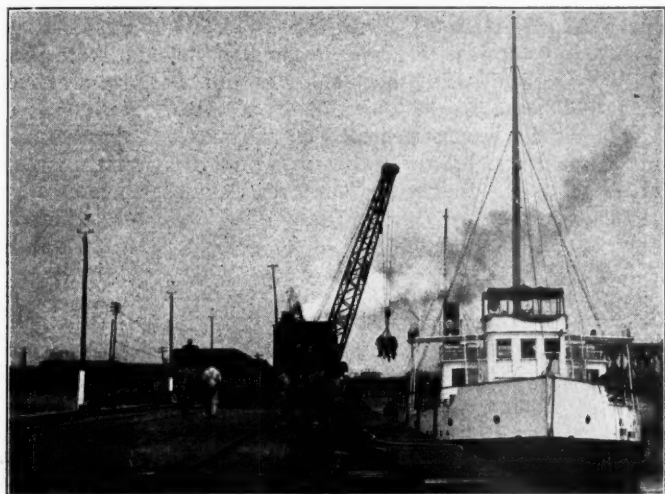
A method for classifying structural timbers according to their density by mechanical tests is one of the most interesting and valuable recent results of our investigations. It is found the strength of the wood bears a direct relation to its dry weight or density; that is to say, the denser the wood the greater the strength. For example, a piece of longleaf pine, which has a specific gravity of about .40, has a modulus of rupture of about 4,600 lb. per sq. in., whereas identically the same kind of wood, but with a specific gravity of .60, has a modulus of rupture of about 10,000 lb. per sq. in. From these mechanical tests and observations certain definite mathematical equations for determining the strength of structural yellow pine timbers have been formulated. Progress has so far advanced that practical grading rules have been developed, and these have recently been adopted by the American Society for Testing Materials, the Southern Pine Association, and the American Railway Engineering Association.

*Abstracted from a paper read before the St. Louis Railway Club, May 12, 1916.

NEW BUFFALO, ROCHESTER & PITTSBURGH DOCK AT BUFFALO

The Buffalo, Rochester & Pittsburgh has completed a new dock at Buffalo, N. Y., which was opened to traffic on June 14, when the steamer Cicoa laden with pig iron unloaded at this point. The dock is intended for the handling of pig iron, pulp wood and other heavy materials and the unloading facilities are furnished by a Brown hoist locomotive crane equipped with a magnet and a grab bucket.

The dock is located on the Buffalo river and marks an additional step in the development of this stream, as it is located farthest up stream of any dock for lake-going vessels.



Unloading Pig Iron from the First Boat

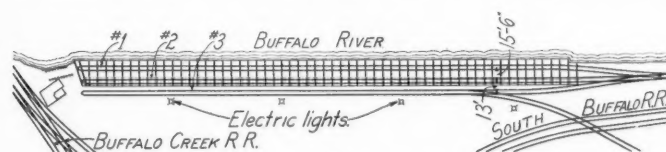
The river improvement is being carried on by the city of Buffalo and provides for a 23-ft. draft at mean low water level to permit the passage of lake-going vessels. This deepening and straightening of the channel is to be extended to the junction of the river and Cazenovia creek, approximately one mile beyond the site of the dock. Incident to this development scheme, lift bridges have been built across the river by the New York Central, the Buffalo Creek, the Delaware, Lackawanna & Western and the New York, Chicago & St. Louis (jointly with the Pennsylvania). Two bridges remain to be built; one by the Lackawanna and one by the city

of Donner Steel Company. Hercules bumping posts are provided at the ends of the tracks on the dock. To permit the continuous operation of the plant artificial lighting is provided by five 300 watt lamps on 30 ft. wood poles.

The construction of the dock was made particularly difficult because of the soft character of the earth. It was necessary to drive piles 65 ft. long to reach bed rock. The piles are driven in bents of six each, all of them being provided with steel shoes. They were properly spaced to support the tracks, one pile being driven under each rail.

The deck is of standard construction with 12 in. by 12 in. white oak caps carrying 8 in. by 16 in. yellow pine stringers 20 ft. long and laid with broken joints. The white oak track ties are carried on the stringers and the entire deck is planked with oak.

The work was so planned that the timber construction closely followed the driving of the piles, saving the necessity of temporary bracing. The face and second rows of piles

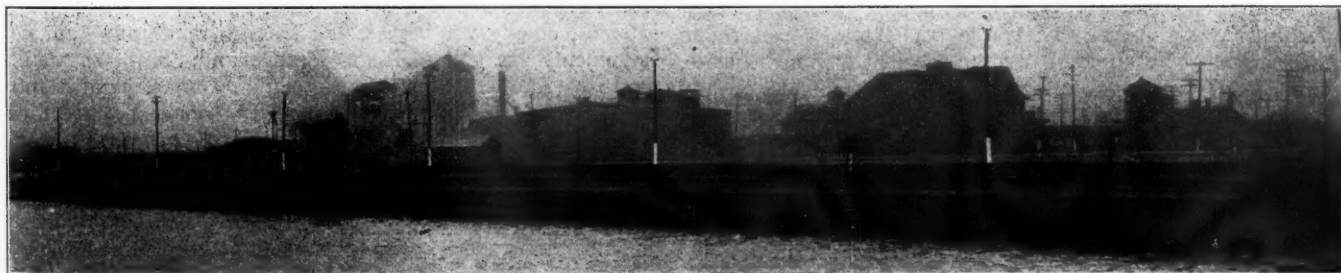


Plan of the Dock

were driven first by means of a water rig equipped with 85 ft. leads. Because of the high winds and to secure stability, the rig was mounted on two scows which were securely lashed together with 12 in. by 12 in. timbers bolted through the deck timbers. The driving was started at the south end and continued to the north. The piles were permanently braced when driven. The longitudinal caps were also applied at the same time, making it possible to utilize this part of the structure as a staging.

A temporary track was then laid on this staging and the locomotive crane was run out on it. When the driving of the face piles was completed the driver was lifted off the scows by the crane and landed on a temporary staging provided for this purpose. The rig, operating as a land driver, was then utilized to place the remaining piles.

As previously stated, longitudinal caps were applied to the face and second rows of piles when driven. These are not tied to the transverse caps of the bents which are free to slide on the longitudinals. This method of construction re-



The Dock from the River Side

of Buffalo, both of which are above the B. R. & P. dock.

The dock is a timber structure 580 ft. long by 30 ft. wide and is carried on pile bents spaced 10 ft. center to center. Two railroad tracks are carried on the deck, one for the unloader and the other for cars to receive the load from the vessels. These tracks are spaced 15 ft. 6 in. center to center. A third track which parallels the structure for its entire length is spaced 13 ft. from track No. 2, making a 28 ft. 6 in. reach for the locomotive crane. The tracks are connected on the south with the yard of the Buffalo, Rochester & Pittsburgh, and there is also a connection with the tracks

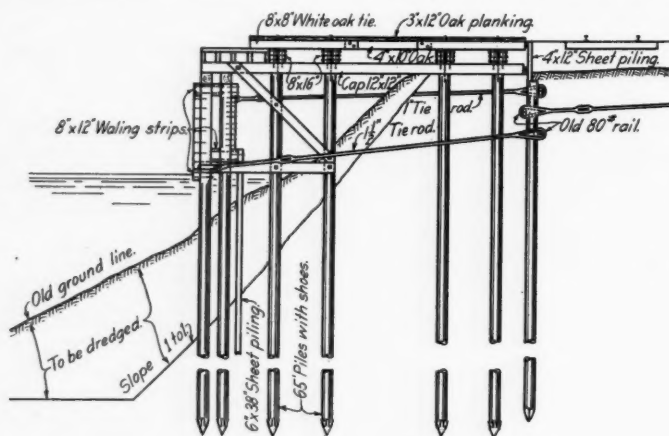
believes the main structure of strains caused by the impact of vessels when mooring. To further protect the structure waling strips were placed at mean low water level and just below the longitudinal caps. Filler strips were placed on all face piles between the waling strips to prevent the possibility of any projection from vessels moored alongside catching under the waling strips and raising the piles with the rise of the water level. This precaution is essential at this point as the river is subject to abrupt changes in level depending on the direction of the wind.

Two lines of timber sheet piling were driven to prevent the

caving of the earth fill. One line was driven back of the second row of piles and the second on the land side of the structure.

The mooring piles are independent of the structure and are not tied to it in any way. Five piles were driven in a cluster and securely bound together with wire cables. The main pile is 65 ft. long and was driven to rock. It is capped with the bell end of a 12 in. cast iron pipe and concrete. The cluster piles are 50 ft. in length.

The entire structure is securely fastened to three rows of anchor piles. The piles of each row are tied together with



Typical Cross Section

old 80-lb. rails which also provided a bearing for the 1½ in. tie rods that anchor the entire structure to the piles. These rods and the necessary turnbuckles were made by a company blacksmith in a shop provided at the site.

This project was carried on under the direction of E. F. Robinson, chief engineer, and F. A. Benz, division engineer of the Buffalo, Rochester & Pittsburgh. The timber construction was handled by company forces. D. E. Manns, of Buffalo, was the contractor for the driving of the piles.

PUBLIC OWNERSHIP OF RAILWAY SECURITIES

An amount exceeding \$2,500,000,000 measured the investment of savings and other state banks and insurance companies alone in railway securities in 1915, according to a compilation by the Bureau of Railway News and Statistics, Chicago. The 19,457 banks held in that year about \$1,265,000,000 in railway stocks and bonds, comprising 33.2 per cent of their total investments in government, state, county, municipal, public service and other bonds of any description; these investments together, next to loans secured by real estate, collateral or otherwise, comprising by far the largest item in the assets behind these banks.

This showing of the public interest in railway problems is especially interesting in view of a statement just issued by the four railway brotherhoods, that railways and not the public are owners of railway shares and that therefore the "public" has little interest in the railway problem.

Depositors in savings banks have an interest more vital than have those dependent on any other class of banks, because savings banks in a pre-eminent degree are investors in railway stocks and bonds. In 1915 the depositors in the 2,159 savings banks included above numbered 11,285,755, over 11 per cent of the total population of the United States, everyone of whom was vitally interested in the securities upon which his savings bank was founded. Of all securities held in the assets of these banks in 1913, the comptroller's report showed 41.8 per cent were railway stocks and bonds, against 25.0 per cent for loan and trust companies; 18.7 per cent for state banks and 6.1 per cent for private banks.

Railway securities equal 17 per cent of all deposits in the savings banks alone. One-sixth of the foundation upon which savings banks rest is thus composed of railway stocks and bonds and is endangered when railway welfare is subordinated to either unreasonable wage demands or unreasonable rate reductions.

Besides the 11¼ million depositors in savings banks, there were in 1914, 39,582,673 life insurance policies in force in the United States, representing over 40 per cent of the population, though, of course, one person often holds more than one policy. How vital an interest these millions have in railways was shown by a competent estimate in 1907 that 31 per cent of the total assets of life insurance companies were railway securities. Were that ratio still to prevail the 1914 investment in railways would exceed \$1,500,000,000. Even if life and accident insurance companies held no more than in 1907, they, with the banks, would hold today over \$2,110,000,000.

The brotherhood statement that the roads themselves and not the investors are the real owners of railway shares is best answered by the Interstate Commerce Commission figures for 1914:

Total capital stock	\$8,680,759,704
Owned by railways	2,669,354,781
In hands of public	6,011,404,923

It is this six billions of stock added to \$9,708,292,002 bonds that is owned by savings banks, insurance companies and other investors that renders protection from hostile railway agitation, vital to millions of our population. This interest in railway welfare is totally apart from the direct economic dependence of every man, woman and child on healthy railways, the most vital organ of our national life.

EXPORTS OF RAILWAY SUPPLIES INCREASE RAPIDLY

Railway materials and equipment valued at \$75,000,000 were exported from the United States in the last fiscal year, according to figures compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce. The exports of this class have more than doubled since 1914.

Until very recently Canada and Cuba have been the foremost foreign markets for our freight cars. Cuba, Canada and Brazil the largest markets for exported locomotives, and Canada, Australia, Japan, Brazil, Argentina and Cuba the leading markets for our steel rails. At present we are sending unusual quantities of freight cars and other supplies to Russia, chiefly via her Pacific frontier, and important consignments are going also to France and Spain, as well as to our established markets in Cuba, Canada and Central America. The following figures for June exports indicate the present important markets for railway supplies; the total exports of freight cars for the month were valued at \$1,613,000, of which \$1,086,000 worth went to Russia. Steel rails to the value of \$1,730,000 were sold abroad during the month, the exports to France alone amounting to \$1,188,000. Of the \$721,000 worth of steam locomotives sold abroad, \$272,000 worth went to Spain.

The quantities of railway material exported during the fiscal year ended June, 1916, as compared with the fiscal year 1914, are shown in the following table:

Classes of railway material exported.	Fiscal year—	
	1916.	1914.
Railway cars	\$26,660,000	\$11,178,000
Rails for railways	17,687,000	10,259,000
Locomotives, steam	12,666,000	3,692,000
Locomotives, electric	455,000	437,000
Engine parts (all kinds)	7,274,000	3,357,000
Switches and other track materials	5,262,000	2,534,000
Ties	2,435,000	2,565,000
Railroad spikes	1,399,000	346,000
Car wheels	742,000	414,000
Telegraph instruments	149,000	137,000
	\$74,729,000	\$34,919,000

THE ASSOCIATION OF RAILROAD SUPERINTENDENTS

The annual meeting of the American Association of Railroad Superintendents was held at the Hotel Chisca, Memphis, Tenn., on August 16 to 18, inclusive. A number of committee reports were presented and discussed in addition to which papers were presented entitled "The Superintendent," by C. H. Markham, president of the Illinois Central; "Building a Line to the Public," by Anderson Pace, manager, Bureau of Railway Publicity of Illinois, and "Efficiency, the Real Test of Education," by J. L. Taylor, assistant to the chief inspector, Bureau of Explosives, New York City. The first two papers were published in the *Railway Age Gazette* of last week.

The officers of this association for the past year were: President, Charles Burlingame, superintendent Wiggins Ferry Company, St. Louis; first vice-president, W. S. Williams, superintendent, Illinois Central, Carbondale, Ill.; second vice-president, C. E. Rickey, superintendent of terminals, Queen & Crescent, Cincinnati, Ohio; secretary-treasurer, E. H. Harmon, Terminal Railroad Association of St. Louis.

One of the subjects considered related to fraudulent service letters. The manufacture, sale and use of fraudulent service letters has grown to such an extent as to render it entirely unsafe in the employment of men to put trust in service letters presented as credentials. Several suggestions have been offered to throw safeguards around service letters and to serve as guarantees of their genuineness. The one most frequently advanced is to require the secure attachment of a photograph of standard size to the letter. It was, however, thought impossible to guarantee the genuineness of service letters and that other means must be adopted to protect the roads against the employment of undesirable men. The use of a printed form of release signed by the applicant and addressed to the road to which the applicant refers is in use on a considerable number of lines. Several roads depend entirely for references on the replies received to such inquiries. The committee stated that "It does not seem to us that any more secure or efficient method can be devised of securing current records of men seeking employment. As less dependence is placed in the service letters presented, their value will decrease rapidly and make it unprofitable to manufacture them."

The proper method of working under the new per diem rules, 14 and 15, was brought to the attention of the association by Arthur Hale, formerly general agent of the American Railway Association. These rules refer to the method of tendering the transfer of cars between connecting lines. The report stated that arrangements should be made at the larger terminals and interchange points for a daily tender of cars held or to be delivered to a connection before midnight whether there is a congestion or whether the interchange is blocked, or if cars are not being taken currently. It is believed that such a daily tender, made regularly regardless of conditions, will overcome many of the difficulties experienced in the past from disputed reclaims arising from exceptions taken to the tenders of the cars.

One of the subjects assigned to the committee on transportation was that of discipline systems. Attention was called to the fact that the New York Central Lines east of Buffalo are employing the deferred suspension system; also that the Delaware, Lackawanna & Western changed from a record discipline system to an actual suspension system three years ago. The committee was advised that the Baltimore & Ohio has had in effect the straight record system of discipline for two or three years, while the Western Maryland has recently adopted this same system.

A report was presented on the conservation of equipment of which the following is an abstract. Efforts to induce the shipper to load cars to capacity are productive of re-

sults. The subject should be brought to his attention at regular intervals and in such a manner that he will appreciate the wastage of equipment. The New Orleans Great Northern issues a monthly statement to the industries located on its line showing a comparison of their loadings. The man in charge of car distribution can do much to stimulate heavy loading by the use of good judgment in filling car orders. By keeping the car supply scant the value of a car is appreciated by all shippers, agents and conductors. All concerned become interested in keeping the cars moving, resulting in a decrease in the average detention to cars. A source of delay to cars that requires watching results from the shipment of company material. All concerned in the handling of such freight should be impressed with the necessity for the prompt release of equipment and the matter should be constantly watched.

Another subject assigned to the transportation committee was the proper charge to make for the return of cars delivered in error. The committee recognized that a line to which a car is delivered in error should be recompensed for the outlay it incurs in returning this car. It likewise appreciated the fact that the most effectual means of minimizing erroneous delivery of cars is to penalize the offender. For that reason it offered for adoption a resolution recommending to the American Railway Association that a charge of \$2 for a loaded car and \$1 for an empty car, plus any intermediate charge that the receiving road might have incurred, should be made by the receiving line against the delivering line on all such cars delivered to it in error.

A subject submitted to this committee for its consideration was the best method of handling locomotives where two or more are employed on one train. The committee recommended that the proper place for a helper engine on trains of 60 cars or more moving over an entire division with a rolling grade is on the front end.

The question of pooling engine crews as opposed to regularly assigned engine crews also came up for consideration, and was the subject of majority and minority reports, the majority report favoring regularly assigned power, while the minority asked that consideration be deferred until further data was secured.

The question of the reduction of train tonnage during times of heavy traffic and a shortage of motive power to compromise between operating results and the increased engine mileage was a subject for consideration by the transportation committee. Its recommendation was that in road service established maximum tonnage should always be maintained in the direction of traffic.

The association has had under consideration for several years the question of uniform car lettering. The committee on interchange car inspection believed that the benefits to be derived by marking the sides of box cars, to distinguish one side from the other readily, were considerable and urged that the American Railway Association take action to cause box cars to be reweighed and stenciled so that the letter "L" will be stenciled next to the left hand side door stop, facing the "B" end of the car and the letter "R" be stenciled in the same position on the opposite side, "A" and "B" being designated as opposite ends of the car.

The equipment and training of car inspectors received attention from the committee on interchange car inspection. The inspector should be a man of integrity with a common school education, be able to write a repair card in a legible manner and be able to understand and properly make out reports and give in writing a clear statement of what he sees. He should have at least two years' experience in actual car repair work at some important railway shop and in addition to having a general knowledge of the construction and maintenance of all kinds and classes of cars he must know the M. C. B. rules, including those for loading materials, air brakes, etc., as well as the United States

Safety Appliance Rules, those of the Bureau of Explosives and the rules of the Operating Department. These men should be required to pass a written examination on all rules which their duty requires them to know, similar to the examinations of enginemen and trainmen. It was also recommended that the car foremen should hold meetings with these men at convenient times to discuss their problems with them.

The question of extending the jurisdiction of the freight agents at the larger terminals over nearby smaller agencies within a radius of the run of local freights out of these terminals was presented and discussed, as a result of which the association resolved that it considered it inadvisable for the agent of a large station to exercise any supervision beyond his particular terminal.

The following officers were elected for the ensuing year: President, W. S. Williams, superintendent, Illinois Central, Carbondale, Ill.; first vice-president, C. E. Rickey, superintendent of terminals, Queen & Crescent, Cincinnati, Ohio; second vice-president, A. G. Smart, division superintendent, Chicago, Burlington & Quincy, Beardstown, Ill.; secretary-treasurer, E. H. Harmon, Terminal Railroad Association, of St. Louis, Mo.

NORFOLK & WESTERN MOUNTAIN TYPE LOCOMOTIVES

In the *Railway Age Gazette* for April 7, 1916, page 799, there was published a description, with drawings, of one of eight locomotives of the Mountain or 4-8-2 type, then under construction at the Roanoke, Va., shops of the Norfolk & Western. These locomotives have since been completed and placed in service and the accompanying engraving from a photograph gives a good indication of their appearance. The weights given in the previous article were necessarily

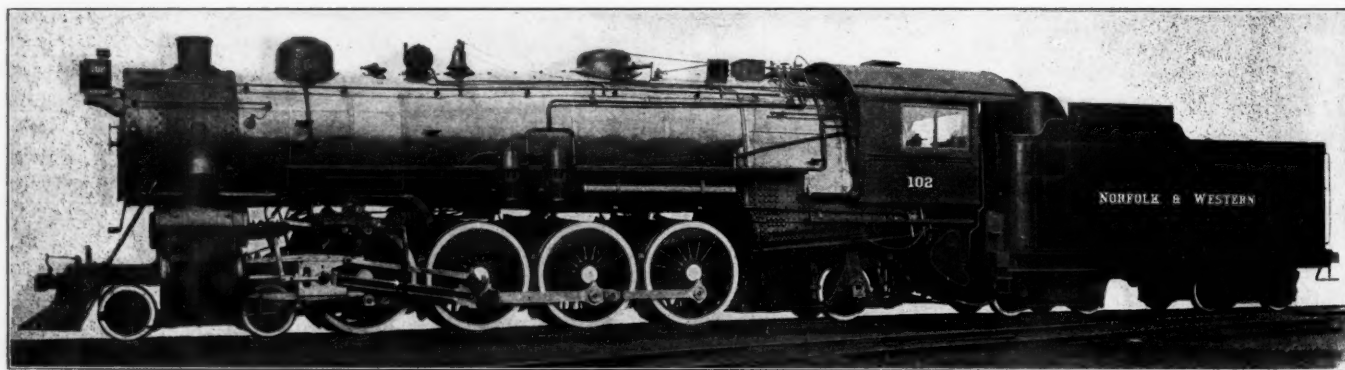
surface is 882 sq. ft. The driving wheels are 70 in. in diameter and the driving wheel base is 18 ft. 9 in., the total engine wheel base being 40 ft. 5 in. and that of the engine and tender 72 ft. 11 in. The tender has a capacity of 9,000 gallons of water and 14 tons of coal.

DETERMINING THE PURITY OF CREOSOTE

T. H. Davis has recently described a simple absorption spot test for the determination of the presence in creosote oil of tar, free carbon or dirt as follows: "Allow six drops of a sample of creosote oil to fall upon the surface of clean, white blotting paper. If carbon, tar or dirt is present it is observed very readily, as it segregates quickly at the center. The paper should be laid away in a flat position for a few hours in a place free from dust. If then examined, foreign matter will be observed in a distinct zone at the center of the spot; the outer zone indicates the character of the oil."

Homer Cloukey, of the Forest Products Laboratory, Madison, Wis., has run a series of tests to verify the Davis absorption spot test and to obtain some idea of the sensitivity of the test for tar, carbon or dirt. In order to make it fairly quantitative, a series of spots were made from carbon-free creosote oil to which free carbon in the form of lampblack had been added in definite graduated amounts. The series comprised six mixtures of creosote and lampblack with percentages of lampblack of 0.0, 0.005, 0.01, 0.05, 0.10 and 0.50.

The results showed an increasing gradation in the density of the free-carbon ring at the center and indicated that 0.005 per cent is easily shown by this test. In heavier percentages than 0.05 per cent the amount in an unknown sample would be difficult to estimate by comparison. The admixture of tar to creosote can be determined roughly from the size of the inner zone and the general character



Mountain (4-8-2) Type Locomotive Now in Service on the Norfolk & Western

estimated and the actual weights in working order are given below:

Weight on driving wheels.....	236,000 lb.
Weight on leading truck.....	52,000 lb.
Weight on trailing truck.....	59,000 lb.
Weight, total engine.....	347,000 lb.
Weight of tender loaded.....	167,500 lb.
Weight, total engine and tender.....	514,500 lb.

These locomotives are being used in heavy passenger service, hauling trains of 11 steel cars over grades with a rise of 84 feet to the mile at a speed of 30 miles an hour. They have 29 in. by 28 in. cylinders, 16 in. diameter piston valves, and develop 57,200 lb. maximum tractive effort. The boiler is of the conical type, 80½ in. outside diameter at the front end, and carries a working pressure of 200 lb. The firebox is 120⅞ in. long by 96¼ in. wide; these figures give a grate area of 80.3 sq. ft. There are 233 2-in. tubes and 36 5⅜-in. flues, all 21 ft. long. The heating surface of the tubes and flues is 3,607 sq. ft., while that of the firebox is 374, giving a total of 3,984 sq. ft. The superheater heating

of the spot. The heavy tar does not diffuse with the speed of the lighter creosote oil.

The presence of dirt, tar or free carbon in creosote in very minute quantities is indicated by this test. If the creosote spot shows a dense black center it will probably be necessary to run a free carbon specification. When pure, high-gravity distillate oil is specified and the spot test is used in the preliminary examination of the oil the slightest adulteration with coal tar can be detected instantly.

It will be noted from the determinations made by Mr. Cloukey that percentages of free carbon greater than 0.05 per cent can be estimated only with difficulty. It is apparent that in order to secure a pure creosote of the quality of No. 1 maintenance of way oil, or a pure, high-grade distillate oil, the spot test is practically essential in the preliminary examination.

The city of St. Paul, Minn., adopted the spot test some time ago and made it a part of its specifications for a pure distillate oil for the treatment of its wood paving blocks.

The spot test has also been adopted by the Diesel Engine Users' Association of England for the examination of the fuel oils used in this type of engine.

OPERATING CONDITIONS AND FUEL CONSUMPTION*

By John G. Sullivan

Chief Engineer, Western Lines, Canadian Pacific, Winnipeg, Man.

The cost of fuel is one of the largest items that go to make up the total expense of railway operation, and calculations of the savings that can be made on this account by the reduction of resistance in the line have been figured in various ways by different engineers.

The comparative statistics kept by most roads, based on the amount of coal consumed in hauling 1,000 tons one mile, or some similar unit, are of very little value to the locating

calculated horsepower hour of work performed. The writer has been of the opinion that this figure is altogether too high to be used in calculating the saving that could be made by cutting out resistance, and he has used in the past a figure of 5 lb. coal per calculated horsepower hour of work eliminated. For the purpose of getting further information on this subject, and to be able to check these conclusions, the writer has made a very extensive study of the statistics of fuel consumption on the Western Lines of the Canadian Pacific for the past 7 or 8 years.

The first results were calculated with the idea of dividing the coal on the straight basis of work done, and in calculating resistance, friction or rolling resistance, it was assumed to average 6 lb. per ton, or equivalent to 15 ft. of rise per mile on level track. This latter figure was found to be too small, as is shown in a more careful study made last year.

The results of the 1915 studies would indicate that 7.7 lb. coal per calculated horsepower hour of work would not be very far from correct, as our studies show an average of 8 lb.,

TABLE SHOWING POUNDS OF COAL USED PER ENGINE MILE IN FREIGHT TRAIN SERVICE

Found by deducting 3 lb. in double-track operation, and 3½ lb. in single-track operation, times the number of calculated horsepower hour of work done back of the tender, from the total amount of coal consumed, and dividing the balance by the number of locomotive miles run in that service.

Subdivision	1915			1914			1913			Remarks
	E.B.	W.B.	Loco.	E.B.	W.B.	Loco.	E.B.	W.B.	Loco.	
Fort William	46	52	D. 10	41	44	D. 10	45	43	D. 10	Double track.
Ignace	63	50	D. 10	45	40	D. 10	36	40	D. 10	Double track.
Kenora	74	71	D. 10	61	58	D. 10	57	60	D. 10	Double track.
Brandon	86	83	D. 10	78	69	D. 10	..	..	..	Double track.
Broadview	70	61	D. 10	64	49	D. 10	..	..	..	½ D. T., ¾ lb. coal per hp. h.
Medicine Hat	85	89	P. 1	108	109	P. 1	..	..	..	Single track.
Calgary	65	55	P. 1	84	79	P. 1	..	..	..	S. T., about ½ the tonnage of Mountain Subd.
Mountain	102	103	N. 3	96	99	N. 3	..	..	..	S. T., oil fuel; 160 U. S. gal. = 1 ton coal.
Shuswap	80	81	N. 3	75	78	N. 3	..	..	..	S. T., oil fuel; 160 U. S. gal. = 1 ton coal.
Thompson	77	78	N. 3	94	101	N. 3	..	..	..	S. T., coal for fuel.
Cascade	63	75	M. 4	71	89	M. 4	..	..	..	¾ D. T., oil fuel; 160 U. S. gal. = 1 ton coal (¾ lb. coal per hp. h.).

Remarks:—In arriving at the above figures, the resistance was calculated by formula varying from $R = 2.2 T + 122 C$ to $R = 4 T + 153 C$, giving much more accurate results than assuming 6 lb. per ton regardless of weather conditions or the condition of loading cars.

engineer. The figures obtained by a few experiments are also of questionable value, for the reason that they generally represent special conditions. It is the writer's opinion that much more reliable information can be obtained from a study of actual operating conditions, taking these studies by the year, therefore introducing into the results the effect that

but this was based on resistance somewhat too small, as mentioned above. The result of these studies, however, was sufficient to convince the writer that the amount of work done was not a proper basis on which to divide the coal. In other words, the coal burned in keeping up steam in locomotives standing at sidetracks is too large a factor to be ignored.

TABLE SHOWING ANNUAL AVERAGE NUMBER OF POUNDS OF COAL CONSUMED PER HORSEPOWER HOUR OF WORK

(Equivalent to lifting 1,000 tons one foot)

Found by multiplying the total gross tonnage (including the weight of the locomotive) by calculated resistance of the subdivision (exclusive of the work done in acceleration)

Year	133.1 M. Brandon		131.4 M. Broadview		134.4 M. Moose Jaw		110.5 M. Swift Current		136.5 M. Laggan		130.2 M. Mountain		128.9 M. Shuswap		Remarks
	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	E.B.	W.B.	
1915.....	6.8	6.7	5.7	4.8	6.2	9.3	6.8	6.7	5.8	6.8	5.0	9.0	5.1	7.2	First 6 months
1914.....	6.4	6.1	6.3	4.8	7.1	9.5	7.4	6.8	6.9	6.5	5.0	8.6	5.0	6.6	
1913.....	6.5	5.9	6.7	5.0	8.2	11.3	10.5	7.8	8.9	7.3	6.0	9.5	6.0	7.7	
1912.....	7.1	6.1	7.2	5.0	7.5	9.8	10.6	7.2	9.6	7.7	6.9	10.8	7.1	8.0	
1911.....	7.0	5.6	8.1	4.7	8.4	8.7	10.9	6.4	8.4	7.2	6.8	10.5	6.4	8.8	
1910.....	7.6	6.1	8.3	5.2	8.1	9.9	9.6	7.0	9.3	7.9	6.3	10.1	6.9	8.5	
1909.....	8.5	7.1	8.5	5.6	7.9	10.9	10.4	7.3	9.3	9.0	6.6	10.2	6.9	9.1	
1908.....	9.2	7.9	11.4	7.8	7.7	11.5	10.5	7.6	...	...	6.7	10.4	7.0	9.0
1907.....	9.2	8.2	10.7	7.2	9.0	12.1	12.5	8.4	...	...	6.9	11.3	6.8	9.7
Resistance....	1513'	2301'	1306'	2784'	2312'	1951'	1052'	2313'	2319'	3937'	6602'	3026'	3202'	2514'	
Remarks.	{ D. 10 locomotive. All D. T. 1912 and later. All S. T. 1909 and prior.		{ D. 10 locomotive. ½ D. T. 1914 and later. All S. T. 1912 and prior.		{ D. 10 locomotive. ¾ D. T. 1914 and later. All S. T. 1911 and prior.		{ D. 10 loc. 1909 and later. M. 1 & 2 1908 and prior. D. T. 1914 and later. S. T. 1911 and prior.		{ N. 3 loc. 1913 and later. M. 4 1912 and prior. S. T. operation. Oil in pushers 1913 & later.		{ N. 3 loc. 1909 and later. M. 4 1908 and prior. S. T. operation. Oil after July, 1912.		{ N. 3 loc. 1911 and later. M. 4 1910 and prior. S. T. operation. Oil fuel after July, 1912.		

Note:—From July, 1912, to September, 1914, oil was figured on the basis of 3½ bbl. = 1 ton of coal; after that date 4 bbl. = 1 ton. Calculated resistance reduced to equivalent rise in feet. Train resistance assumed in the above calculations equal to 6 lb. per ton, or 15 ft. of rise per mile.

weather conditions have on the fuel consumption for the entire year. Some very good authorities have arrived at the conclusion, after studying annual reports of railways in the United States and Canada, that the fuel consumed in freight service amounts to approximately 7.7 lb. of coal per cal-

A more careful study was made in 1916. The resistance was obtained by substituting the number of cars and the gross tonnage in the formula for train resistance for the various months, when the work was figured by the month. When figured by the year, an average formula for train resistance for the year was obtained by taking the propor-

*From Bulletin 187 of the American Railway Engineering Association.

tionate formula for the month, depending as to how the amount of the work done in that month compared with the total done during the year.

The locomotives used are all superheated and have the following general features:

Class	Weight on drivers	Number drivers	Cylinders
P. 1	198,000	8	23½ in. by 32 in.
N. 3	198,000	8	23½ in. by 32 in.
D. 10	142,000	6	21 in. by 28 in.
M. 4	168,400	8	21 in. by 28 in.
M. 2	140,000	8	20 in. by 26 in.

The variation in resistance during the different months has an appreciable effect. The fact that eastbound resistance for February was comparatively high is accounted for by a large number of lightly loaded cars moving east that month coupled with a high rate of resistance on account of the weather. The very low rate in September eastbound traffic is accounted for by the very heavy and full loading of cars.

The monthly variation in fuel consumption is not so easily accounted for. The relatively heavy fuel consumption during July and August on three subdivisions is accounted for by the very small amount of traffic handled. There must of necessity have been considerable light running. The heavy fuel consumption during 1915, as compared with 1914 and 1913, is accounted for by the time of the year the majority of the work was performed. In 1915, during the months of October, November and December, 64 per cent of the entire year's work was performed, while during the same months in the years 1914 and 1913 only 27 per cent and 45 per cent, respectively, was performed.

The large amount of coal consumed on the Mountain subdivision as compared with that on the Shuswap and Cascade subdivisions, is accounted for by the fact that a great number of pushers are used on the Mountain subdivision, and although they are burning oil, they are not efficient for the reason that steam is kept up all day, while possibly the locomotive is not in service one-quarter or at the outside, one-third of the day. In addition to this there is about 50 miles of 2.2 grade against eastbound traffic and about 21 miles against westbound traffic. This heavy grade must be a factor in the fuel consumed and running locomotives over them.

In comparing the fuel consumed on the Cascade subdivision with fuel consumed on the Mountain and Shuswap subdivisions, the weight of locomotives must be taken into account. Had the same amount of work been done on the Cascade subdivision by N. 3 engines, and the same amount of coal burned, there would only have been required 86 per cent as many locomotive miles. If this had been performed, it would have reduced the coal consumed per locomotive mile to 64 lb. We could not hope to get these results, but the writer believes that had N. 3 engines been used on this subdivision, the total amount of fuel consumed would have been reduced, although the amount per engine mile might have been slightly increased, but owing to the large capacity of the locomotives, less locomotive miles would have been required.

The writer's instructions to locating engineers in regard to the item of saving in fuel are as follows: Figure fuel saving for double-track operation at 3 lb. per horsepower hour of work eliminated plus 40 to 60 lb. of coal per engine mile eliminated, depending on the class of water, coal and locomotive used. For single-track operation, on a fairly busy line, figure 3½ lb. of coal per horsepower hour of work eliminated, plus 60 to 80 lb. of coal per engine mile eliminated, depending on conditions.

HENRY W. THORNTON NOW A LIEUTENANT-COLONEL.—Henry Worth Thornton, the general manager of the Great Eastern Railway, and formerly general manager of the Long Island, was recently made a lieutenant-colonel in the engineer and railway staff corps.

CONQUERING THE ALPS BY CABLE RAILWAY

By Our Special European Correspondent.

The teleferica, or cable railway, is as wonderful and as useful in mountain warfare as wireless is on the sea. What the first prairie schooner was to the plains, the teleferica is to the mountains. My friend and writing companion, Will Irwin, called it in his picturesque way a bread basket, or department store bundle carrier. It is the bridge between low mountain and high mountain. The railroad runs in the valley at the foot of these gigantic upright cliffs of the Alps. The freight, however, has to be picked up and distributed from the steam or electric railways through the valley stations by wagon or automobile truck and then it must go up the mountains on mule and manback and finally on manback alone, bit by bit. But here the teleferica steps in and says: "Let me do it. I'm quicker and surer—I can go in all weathers. Avalanches can't stop me."

What the teleferica can do, what it has done and is doing, is a matter of record in the Italian army. Along this 400-mile front it daily does carrying equal to that which could be done by six army divisions of 240,000 men—or 120,000 mules. The last figure is interesting when it is considered that there are but 175,000 mules and horses used for all purely transportation purposes in this gigantic army which the Italians have organized to fight the Austrians.

These bread baskets each month carry into the country of eternal snows 108,000 tons, or enough to equal the capacity of more than 20 ships of 5,000 tons each.

According to the official statistics of the army, there are 125 miles of teleferica scattered along the front, with a total daily carrying power of 3,600 tons. The carrying power of each teleferica built is roughly 30 tons, as in the case of the one I visited. There are roundly some 120 different stations, each with a line a mile or so in length. The one I used in reaching a height of 11,000 ft. on the side of Monte Adamello, in the central Alps, a relatively short distance from the Swiss frontier, did the work of 2,000 men a day.

The operation of the teleferica is not so much more difficult than that of the average electric elevator in a skyscraper. Once the heavy motors and machinery are gotten up the mountain sides—a big task in itself, however—together with the stringing of the three-quarter inch steel cables across deep valleys and chasms and rivers, then the mounting of the car, two feet wide by four long, upon the overhead cable and the attaching of the pulley cable become simple jobs.

Riding in it as a passenger, however, is not so simple. When anybody is in a war-zone, and especially after he has visited numerous firing lines and been under constant rifle and artillery fire, it borders on the ridiculous to be afraid of anything, as, for example, falling out of a teleferica, or having it go tumbling down, because of a broken cable, a few hundred feet into the ice and through the snow to the hard rock underneath. The sensation of fear originates from unfamiliarity and strangeness.

As a special privilege I was permitted to ride up to the glacier country in the teleferica. Afterwards, I almost regretted I had not climbed up, along with the burros and the soldiers. My sensations could not have been different from those of old country people taking their first ride in a train, though I had perhaps a more clearly defined conception of what would happen to this lone American citizen so far from home should the teleferica decide to drop him in mid-air.

We had been coming up all morning by burro from the valley, the Alpinist colonel and I, riding along narrow roads built on the side of a huge mountain. A mis-step of the burro at any time and I would never have taken that teleferica ride; I would have dropped two or three hundred feet into the cold waters of a stream that sparkled and raced in

the sunlight. But this burro ride merely produced a sensation of uneasiness.

When we came to a small shack blocking the road, the Colonel said: "Now for the teleferica." He dismounted, greeted the officer in charge of the station, and let me take a look around to investigate the teleferica. It didn't look very imposing—just a couple of heavy motors with cables. My eye followed those cables, however, and they seemed to keep going across the valley and up the side of the opposite mountain until the eye, dazzled by the snow, could follow no longer. "Well," remarked the colonel, as he cheerily knocked the snow from his thick, hobnailed boots, "suppose we go up."

We climbed into the basket, the side rails of which were certainly not more than six inches high, though I did not note this when the car was still within two feet of solid ground. A whirring of wheels, and our car ran smoothly into space. "I hope the thing breaks; then I won't have to follow you," laughed Irwin as he waved goodbye.

I held on for dear life to those low sides and fervently hoped the colonel wouldn't rock the boat and spill us out. "This thing wouldn't pay as a passenger proposition in peace times," I remember saying to the colonel. Indeed, it would pay about as well as a similar teleferica operated between the top of the Woolworth building, downtown New York, and the Metropolitan tower in Madison square.

"But just suppose we had built more of these telefericas in peace times, up here in these mountains; suppose we had built more steam and electric passenger lines, we would have been vastly better off from a military point of view in the war," answered the colonel, as the car began to run more smoothly on the upclimb part of the cable. The colonel was an enthusiast, like all of the officers of the Italian army. "I'm sorry you didn't build a regular railway line to the peak of Adamello before you decided to take me up there, anyway," I said.

Here the car began to climb upgrade as it approached the mountain side. It ran upgrade, on a 30 degree incline for a couple of minutes and stopped, for we had completed the first teleferica section of the three that would take us to our destination. In seven minutes we had traversed a distance that on foot required an hour. We walked along a reasonably gentle upclimb for a mile towards the second teleferica station, following the five-foot road used by the burro trains and the territorial troops which carry on their backs the material for which there is no room in the teleferica. As the weather was clear and there was no danger of avalanches, the colonel devoted time to informing me on various phases of mountain transportation work.

The quality of all these Italian officers that impresses one is their earnestness and pure joy in their work. In talking with them and listening to them discuss their problems, one forgets they are soldiers and that their ultimate object is to equip and organize the firing line so the enemy may be defeated. "The intent to kill," seems totally foreign to their thoughts, nor, as is popularly supposed, does officer work consist in wearing showy, tailor-made clothes and giving orders to common soldiers. While discipline is maintained, the atmosphere of a great mountain military camp is not much different from that of a place where a big construction job is going on, with all hands interested in its successful completion. That night, after we had been safely carried through more dizzy distances until we had reached the camp built around the old Garibaldi Refuge, we gathered about the officers' mess and there I listened to these men discuss in their own tongue the thousand and one details that take up some 18 of their 24 hours each day.

The mess room was also their work room. Its walls were covered with maps of the mountain country. In one corner was a typewriter for legibly preparing orders to be passed on to the officers on the firing lines. In another corner was the telephone that ran one way further up the mountain, out

upon the glacier, and the other way down the mountain to the different camps until it reached division headquarters.

The officer in charge of the station, from which was at this time being launched a series of attacks against the enemy, had just come in that night from a long journey over the snow and ice to the front lines. His face was burned with the sun-burns one gets up here until the skin was almost black, not brown.

He talked of many details, which inevitably fell into four groups—food, clothes, transportation and arms. Men have to talk about primitive subjects when they are dealing with nature in her most primitive and unconquerable aspects. Before reaching the enemy and dealing with him, nature had first to be dealt with. There were questions of more skis for the ski-men, or more white clothes to make them invisible on the snow, of more sleds to drag supplies upon, of making the men wear their yellow snow glasses to keep them from going temporarily blind, of making them protect themselves from the bitter treacherous cold so their feet would not freeze, of keeping them supplied with grease each morning to make their shoes cold and water proof, and of bringing up more steel frames and timber to complete shacks so the soldiers might live better protected against the weather.

Already many heavy pieces had been brought up, but at the expense of months of valuable time. It was stated that to bring from a certain locality a single 149 mm. gun a distance of 20 kilometres it had required two months of time and many gangs of men working 200 to the gang. Twenty days of this time had been lost waiting for snow avalanches to fall. On one occasion the lives of 40 men had been lost and the cannon buried so deep it had to be dug out at great effort. A fair day's work at dragging the cannon was about 100 metres at certain steep places, and "when the snow looks like wheat flour, we take to cover for this means avalanche weather," explained one of the officers. On the whole, to plant cannon higher than they had ever been planted before and to raise a few pieces the difference between 2,000 metres and 3,300 metres above sea level—1,300 metres—great effort, time and ingenuity had been necessary.

"We've got to use the teleferica for such work," declared one officer impatiently. "It has been used for this in the Cadorna and Carnia sections of our front and we must do it here."

Out of courtesy to the guests, the commanding officer, with that pleasant way these delightful Italians have, finally stopped the serious conversation, told the soldier waiter to bring in a bottle of wine and there, standing in the smoke stained, cold-beaten refuge named in honor of Garibaldi, Italy's Washington, we drank to "America," to "Italy," to her brave and enduring soldiers, and lastly to the "Alpini," to these hardy mountain men who have pushed up and onward into the treeless heights at sacrifices I despair of ever conveying on cold paper.

After cheery "Good nights" from these officers whose cares never burden them so much they fail to be unpleasant or impolite, they went to their beds and blankets, to get the sleep necessary for the work awaiting them on the morrow.

Irwin and I, having no battles to fight, spent some five minutes clambering along a slippery path a few hundred feet from the refuge to the teleferica station proper where we found the night crew of soldier mechanics keeping it going. One of their jobs was to send down the mountain some soldiers whose feet had gotten frost-bitten out upon the glacier, whence just then we could hear the high blow of the *tormenta*, the cold wind that springs up like the squalls of the Atlantic ocean and torments, harasses, blinds and perhaps freezes the unlucky soldier caught without shelter.

Everywhere one goes on the Italian front, he finds soldiers who have been to America and who have worked on our railroads. The other soldiers spoke of us ever as the *borghese* or the *inglese*, but these greeted us as friends, fellow-citizens,

and in our own tongue. Up there it was the same story, and it was almost pathetic the manner in which these fellows who had been in the United States spoke to us, welcomed us, recalled the good times they had had "in America." One of the mechanics operating the teleferica had learned how to do it handling a steam winch on some railroad construction work. As he sent down the soldiers with frozen feet on the teleferica, he remarked, with the sudden gleam of cheerfulness always leaping out of the hearts of these Italians: "Those tormentas, they are like the Austrians; you can't trust them."

The next morning as we went on foot down the mountain, Alpine stock in hand, we saw some more of these cheerful Italians whose soldiering is not much different from their work as laborers among us. Some time I am going to tell more about these great children who never grow up, who are so easy to handle if one only is kind to them and applies a little of the golden rule. When the war is over, many more will come among us again, and we should better understand these simple-hearted fellows. I am sure if we spoke their tongue, instead of letting them be exploited by their own padrones, we should think differently of them, because we would be able to speak with them, give them a little of the sympathy which their kindness of heart yearns for; nor would we wound the vanity of these people who are proud of their homely virtues.

As we walked we could better see the work of the teleferica overhead. We also met line after line of burros and soldiers afoot doing work that there were not yet enough telefericas in this section to do, and by the very difficulty of their climb-

THOMAS TRANSMISSION MOTOR CAR

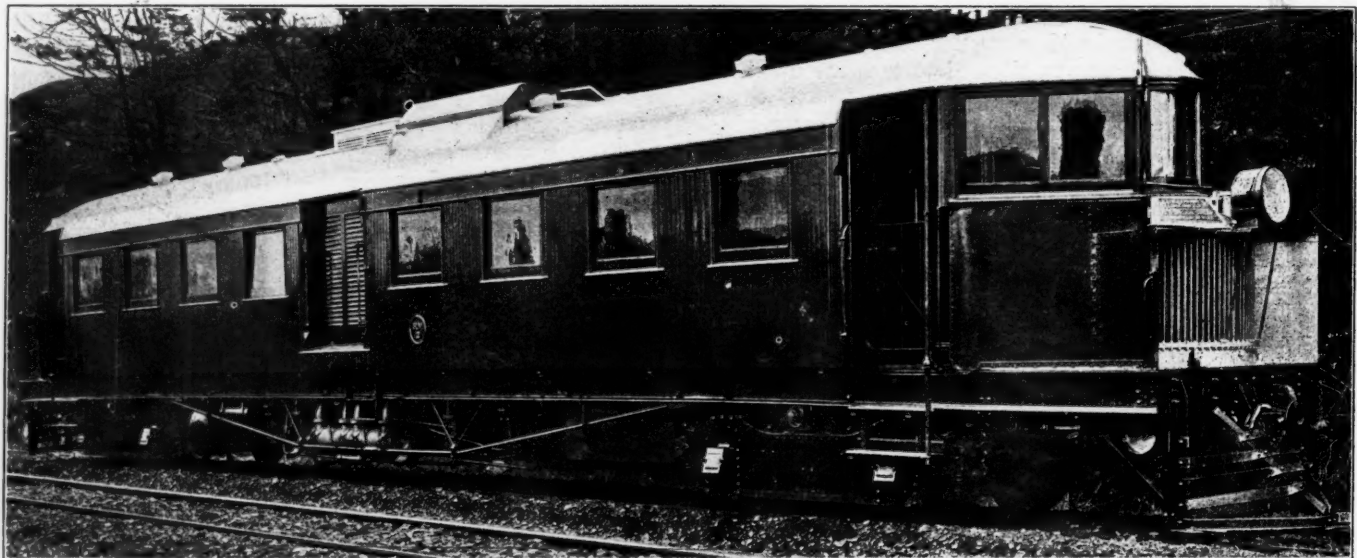
There has just been completed at the government railway work shops, Petone, New Zealand, a motor coach possessing many striking features. The vehicle, with the exception of the body, was supplied by the Thomas Transmission, Limited, 14 Leonard Place, Kensington, London, W., and the system of transmission is known as the Thomas Transmission.

The main power unit consists of an eight-cylinder gaso-



Motor Car Hauling Train of Hospital Cars

lene engine of the V type, in two sets of four cylinders each, having a bore of 7 in. with a stroke of 8 in. Opposite cylinders act on the same crank. One cylinder of each pair has a forked connecting rod with bearings on the outside of the brasses of the rod of the opposite cylinder. By this means the length of the engine is kept within reasonable limits. The valves are located on the outside of the cylinder castings for accessibility. One Claudel-Hobson carbureter is fixed to each



Motor Car with Thomas Transmission for New Zealand Government Railways

ing we realized, exactly how great was the service of the teleferica that hummed and spun aloft. For a mile above us we saw long lines of soldiers tugging at the ropes of the cannon, trying to pull other cannon upon the glacier positions. For miles below us, as we walked on at a rapid, swinging gait we saw whole miles of the narrow path traversing like a long black cable the snowy white of the valley and upon this path, like crawling ants, kept coming and coming burros and soldiers—all part of the transportation system of a great army, the wonderful link in which was the teleferica.

MILITARY TRAFFIC ON THE GREAT WESTERN RAILWAY OF ENGLAND.—Since the beginning of the war to June 30 last, more than three and a half million officers and men of the military and naval forces, 489,249 horses and mules, 13,334 wagons, 1,627 guns and limbers, and 13,000 bicycles, have been carried by the Great Western Railway.

end of a common induction pipe, and the inlet and exhaust pipes are placed on the outsides of the cylinders. The silencers, one for each set of cylinders, are located on opposite sides of the engine. Dual ignition and separate magnetos for each set of cylinders are provided. The engine is reversible and the rotation of the cam-shaft, which is fitted with small flywheels to minimize backlash, is always in the one direction, irrespective of the crankshaft rotation. This ensures that the oil and water pumps, as well as the magnetos, rotate only one way.

Water-cooling radiators are fitted at each end of the car, side ducts allowing a free current of air in whatever direction the car may be running. Oil-cooling radiators are provided, one for cooling the lubricating oil for the engine, and one for the oil which lubricates the planetary or epicyclic gearing. The Thomas electro-mechanical transmission consists of two electrical machines (each of about $\frac{1}{2}$ normal hp. of the

gasolene engine) and a planetary gear. The engine is located in the middle of the car, having the planetary gear, and the first electrical machine at one end of the engine and the second at the other end. The first electrical machine, in conjunction with the planetary gearing and two magnetic clutches, forms a rigid unit. The engine drives the casing of the planetary gearing and the latter splits the drive into two paths, one driven shaft providing a mechanical drive to the outside axle of one truck, while the second driven shaft (which is hollow) drives back to the first electrical machine referred to.

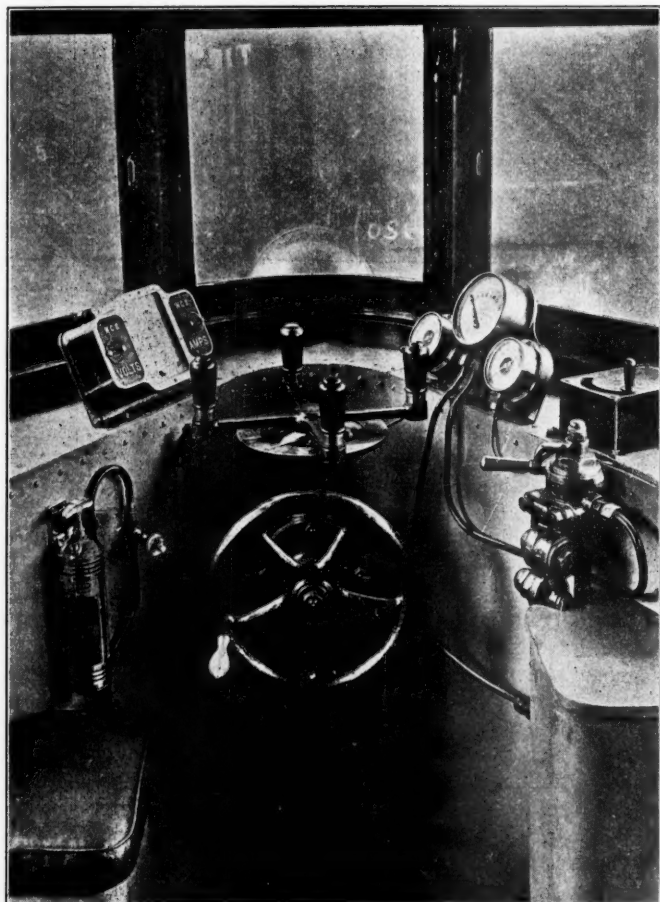
Current is transmitted from this first electrical machine to

planetary gearing solid, and also reduces the current generated to zero. By moving the controller handle to a position beyond "top speed," the battery used for starting the engine (but not for propelling the car) may be recharged. The car can be driven from either end at will.

Westinghouse brake equipment is provided; the car is lighted with electric light and has an electric headlight at each end. Hand brakes are used, as well as air sanding apparatus.

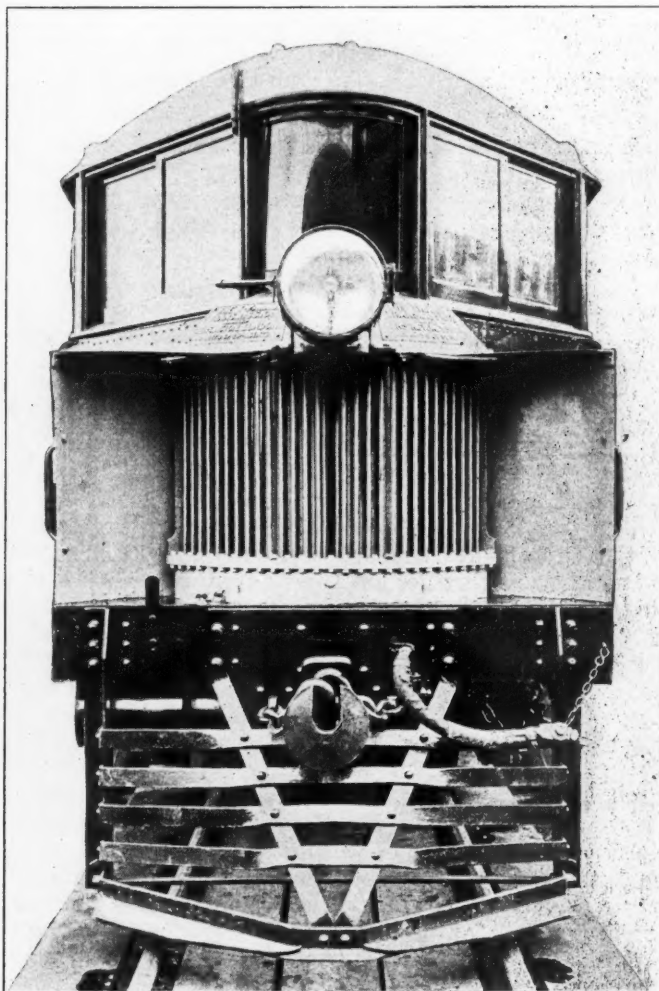
The above arrangement is considered ideal for a gasolene-electric coach as a direct mechanical drive on top speed is obtained, as well as the flexibility of a purely electrical drive.

The total weight of the car is 80,600 lb., about 20,000 lb. of which comprises the weight of the engine, transmission gear, radiators and electrical machines. The car is capable



Interior of the Cab of the New Zealand Railways Motor Car

the second electrical machine at the opposite end of the engine, to which it is *not* connected mechanically. This second machine provides an electrical drive to the outside axle of the second truck. A main controller which provides twelve speeds, operates the car. By reversing the direction of rotation of the engine the same speeds in the opposite direction are secured for continuous running. To start the car the control handle is placed in "start engine" position which connects the car battery across No. 1 electrical machine. By closing an auxiliary switch the No. 1 machine is coupled to the engine, thus starting it. Once the engine is working, the auxiliary switch is moved to the "off" position, and the main controller placed in the first speed notch. By slowly operating the auxiliary switch to the "on" position, the free wheeling clutch is gradually engaged, causing No. 1 machine to rotate in the reverse direction to the engine and produce a mechanical drive to one truck and by the transmission of current to the second machine an electrical drive to the other truck. As the car gains in speed the main controller handle is gradually moved to "top speed" position, when the direct drive from the engine to the running wheels is obtained by the engagement of the top speed clutch which locks the



A Front View of the Motor Car

of hauling a 33,600 lb. trailer up a grade of 1 in 40 at 15 miles an hour, the gross load being over 112,000 lb. The maximum speed on the level is over 40 miles per hour. The gage is 3 ft. 6 in.

BRITISH RAILWAY UNIONS ASK WAGE INCREASE.—According to a London press report the British railway unions have decided to ask for an increase of ten shillings weekly in the wages of all employees. The increase is declared necessary to meet the higher cost of living. The decision has caused surprise, as under an agreement entered into last October, a small wage increase was granted on the condition that the railway men make no further demands during the war.

COMPARATIVE WATER SERVICE COSTS

By P. M. La Bach

Assistant Engineer, Rock Island Lines, Chicago, Ill.

Various units have been proposed from time to time as a means of comparing the relative costs of the water service of different railroads. The unit most frequently utilized has been the freight ton mile, which is a convenient figure, as it is found in the published statistics of the Interstate Commerce Commission. However, it ignores the question of passenger tonnage. The ratio of the latter to the former varies widely and in addition the amount of water needed to haul a passenger ton one mile exceeds that for a freight ton anywhere from 50 to 150 per cent. It is evident that any figures which have for a common divisor only a part of the work done must necessarily be in error.

The cost of operating a pumping plant, exclusive of fixed charges, involves a constant and two variables. The constant is the pumper's wages and the variables, the cost of fuel and the cost of repairs. To express it mathematically:

Let K = pumper's wages.
Let G = cost of fuel per 1,000 gal. pumped.
Let R = cost of repairs per 1,000 gal. pumped.
Let N = number of 1,000 gal.

Then the total cost per month equals $K + (G + R) N$.

Assigning units which are frequently found in practice, we have:

K = \$50 per month.
G + R = \$0.01.
N = 500.
\$50 + 5 = \$55.

Cost of pumping 1,000 gal. = \$0.11.

K = \$50 per month.
G + R = \$0.01.
N = 1,000.

Cost of pumping 1,000 gal. = \$0.06.

K = \$50 per month.
G + R = \$0.01.
N = 3,000.

Cost of pumping 1,000 gal. = \$0.027.

Where larger amounts are pumped it is frequently found that another pumper is employed. This fact has a direct bearing on statistical studies of this nature. It is important to know how much water the stations furnish as units. The quantity of water used is in direct ratio to the amount of work done by the locomotives taking water at that particular station. Also water stations are spaced as far apart as the tender tanks will permit and are usually constant in number for an engine district. If under these conditions the traffic is doubled the amount of water needed will be doubled, but the cost does not vary in the same ratio. In comparison, therefore, some allowance must be made for density of traffic. This may appear to be hypothetical, but there are many divisions of light traffic on which the pumper's wages exceed the cost of fuel, while on others with more trains the reverse is true. Another factor entering into the question is the question of grades. A railroad having light grades will perhaps haul twice as many tons per unit of water consumed as another with heavy grades.

In looking for another unit attention has been called to the fact that a locomotive develops about the same average horsepower mile after mile. For instance, a Consolidation locomotive of 1,200 hp. will be used to its limit, except on descending grades, no matter what load the ruling grade permits. Assuming that the rated horsepower of locomotives will average about the same on the various railroads, the locomotive mileage could be used as a unit except for the fact that passenger locomotives use about half as much water per mile as freight locomotives. To overcome this difficulty the use of what may be called constructive engine mileage is suggested; that is, one made up of the total freight engine miles plus one-half of the passenger engine miles.

For the purpose of comparing units, the table given herewith has been prepared to show the cost of water on 21 railroads with reference to three units, namely, "mile of road," "1,000 ton miles," and "constructive engine miles."

The cost in terms of miles of road gives high values for the line with heavy traffic. The cost per ton mile has the objections enumerated heretofore, while the constructive engine mileage gives relatively higher values for the road with the heavier average train loading. None is, therefore, entirely satisfactory.

DATA ON THE COST OF WATER ON 21 RAILROADS OVER 950 MILES LONG.

	Per Mile of Road		Cost of Water		
	Freight ton miles	Constructive engine miles	Per mile of road	Per 1,000 ton miles	Per constructive engine mile
Eastern Roads	5,430,286	13,586	\$282.10	\$0.052	\$2.08
	2,788,075	9,970	128.10	.046	1.28
	2,997,966	8,422	91.80	.031	1.09
	4,255,513	12,975	142.70	.033	1.11
	3,223,935	8,679	96.60	.030	1.11
Southern Roads	3,011,617	5,022	67.70	.032	1.34
	1,116,491	4,955	43.60	0.039	0.88
	651,835	3,702	37.00	.057	1.00
	1,633,461	5,424	55.30	.034	1.02
	677,129	4,519	48.40	.071	1.07
Middle Western Roads	834,338	3,229	41.20	0.049	1.28
	942,339	3,000	33.20	.035	1.11
	629,184	3,165	43.70	.068	1.38
	1,417,388	5,038	95.10	.067	1.88
	911,648	3,149	41.80	.046	1.32
Western Roads	609,465	2,642	50.30	.082	1.90
	706,150	3,090	70.90	0.100	2.27
	732,032	3,871	63.00	.086	1.63
	788,895	2,516	81.40	.103	3.23
	1,051,809	3,836	72.60	.069	1.89
	531,952	2,989	46.60	.087	1.56

Also any calculations for the cost of water on a railroad, no matter what the unit, which include all water expenses are manifestly unfair to those roads which are treating a considerable portion of their water in water-softening plants. Railroads in a large part of the United States can afford to add considerable amounts to their water service costs by treating the water. While this will result in large economies, unfortunately they will not be reflected in water service costs. The same may be said of track pans. They save costs in fuel and overtime, but add to the cost of water service itself.

In view of this we can never expect to have any true comparison of the efficiency of water service on the various railroads until some means is developed for taking all of these items into account. It might be simpler to subtract the cost of these items from the total water service cost in order that a comparison might be made between figures that give only the cost of pumping the water. On many railroads the cost of water is too high, principally because the water service is without direct supervision by anyone familiar with the problems involved. In consequence a unit for the cost of water on railroads, which will permit of a fair comparison, is sorely needed and an effort should be made to obtain one.

RAILWAY PROFITS AND THE COMMUNITY.—We confess ourselves at some loss to understand the meaning of Sir Guilford Molesworth's recent remark, which has gained wide publicity through quotation in the press, that "the enormous profits of railway companies are a national misfortune." Save for a very few exceptions, due to special local causes, no railways in the world, and least of all those of the United Kingdom, can be said to make "enormous" profits, since it is a platitude that in no other industry whose capitalization is at all comparable is the average level of dividends so low. Moreover, as has so often been pointed out, one of the most expensive luxuries in existence is a poverty-stricken railway, by reason of its inability to meet the demands of the community. England is a striking example of the fact that a railway paying large, or relatively large, dividends gives a better service to the public than one whose shareholders receive only a small average return. The United States also has reason to realize that fact. Incidentally, it might be pointed out that to talk of the "enormous profits" in the case of British railways just now is somewhat unfortunate when they represent the only great industry in the country not earning war profits.—*Railway Gazette*, London.

TRAIN ACCIDENTS IN JULY¹

The following is a list of the most notable train accidents that occurred on the railways of the United States in the month of July, 1916:

Collisions

Date	Road	Place	Kind of Accident	Kind of train	Kil'd	Inj'd
4.	Florida E. C.	Durbin.	rc	P. & F.	0	0
15.	Pere Marquette	Grandville.	bc	P. & F.	0	15
17.	Virginia & S. W.	St. Charles	bc	P. & F.	0	3
17.	Denver & R. G.	Denver.	rc	P. & F.	0	5
17.	Great Northern	Todd, N. D.	bc	P. & P.	0	3
23.	St. Louis, B. & M.	Bay City	bc	F. & P.	0	8
25.	Norfolk & W.	Belspring.	rc	F. & F.	2	6

Derailments

Date	Road	Place	Cause of Derailment	Kind of train	Kil'd	Inj'd
6.	Gulf & S. I.	Bond, Miss.	washout	P.	2	0
8.	Erie	Lanesboro.	b. rail	P.	0	1
9.	Mobile & Ohio	Sparta, Ill.	unx	P.	0	10
9.	Gulf C. & S. F.	Chriesman.	d. rail	P.	0	1
10.	Western Md.	Montrose.	d. eq.	P.	0	5
13.	Phila. & R.	Hellertown.	unx	F.	0	2
15.	Western Md.	Durbin.	d. eq.	P.	0	7
21.	New York Cent.	Troy.	slide	P.	0	1
22.	Boston & Maine	Rutland.	slide	P.	0	1
23.	Central Georgia	Fitzpatrick.	d. track	P.	1	6
*24.	Denver & R. G.	Goodnight, Colo.	b. wheel	F.	1	1
29.	Balt. & Ohio	Cairo, W. Va.	d. track	P.	0	0
29.	Grand Canyon	Willaha.	flood	P.	1	2

The trains in collision at Durbin, Fla., on the 4th were a southbound passenger and a southbound freight, the passenger running into the rear of the freight. Five freight cars were wrecked. The injuries to passengers and trainmen were all of a slight nature.

The trains in collision at Grandville, Mich., on the 15th were an eastbound electric car and a westbound steam locomotive without a train. Fifteen passengers were injured.

The trains in collision near St. Charles, Va., on the 17th were train extra east, engines 69 and 73 of the Virginia & Southwestern and an eastbound mixed train No. 66 of the Louisville & Nashville. One engineman, one fireman and one conductor were injured. One of the engines was considerably damaged and three freighters were slightly damaged. A brakeman in checking the register, read engine 66 for train No. 66, whereas the register indicated that local freight No. 93, engine 66, had passed the point of register rather than Louisville & Nashville train No. 66.

The trains in collision near Denver, Col., on the 17th were northbound passenger No. 12 and a freight train which was standing on a side track. The engine of the passenger train and 4 cars of the freight were wrecked. Four passengers and the engineman of the passenger train were injured. The collision was due to the thoughtless act of the conductor of the freight, who threw the switch as No. 12 was approaching.

The trains in collision at Todd, N. Dak., on the 17th were a westbound express and an eastbound local passenger train. Three passengers were injured.

The trains in collision at Bay City, Tex., on the 23rd were an extra, southbound, carrying troops, and second No. 4, northbound, carrying homeseekers. Eight passengers were slightly injured. The southbound train had an order giving it the right of road to Bay City only, and until 6:20 a. m.; but it stopped at that point until about 6:50, taking water, and then proceeded southward, and soon met the northbound train, on a curve. It was not visible from the northbound train because of a freight train standing on a side track, on the inside of the curve.

The trains in collision at Belspring, Va., on the 25th were westbound through freights. A train, in which were some camp cars, occupied by an extra gang, standing between the switches on the main line, was run into at the rear by a following freight, wrecking seven cars. Two workmen were killed and six other employees were injured. The collision

was caused by a failure in block working. The second train received a clear signal when the block was occupied by another one. The conductor and a brakeman of the standing train are also held at fault for not protecting their train, there being a fog at the time. The engineman of the second train also disregarded the rule to move between switches, during fogs, at restricted speed.

The train derailed at Bond, Miss., on the 6th was a northbound passenger. The derailment was caused by a washout; the engine was overturned, and the engineman and fireman were killed.

The train derailed at Lanesboro, N. Y., on the 8th was eastbound passenger No. 30. The derailment was due to a broken rail, but the engine and two cars passed over in safety. There were no injuries to passengers and only one employee was slightly injured.

The train derailed near Sparta, Ill., on the 9th was southbound passenger No. 1. Ten passengers were injured. The cause of the derailment was not determined. The tender was the first vehicle to leave the rails.

The train derailed near Chriesman, Tex., on the 9th was northbound passenger No. 16 and the whole train, consisting of a locomotive and five cars, was overturned in the ditch. The road was blocked about 12 hours, but the reports say that only one person was injured. The derailment was due to a defective rail.

The train derailed near Montrose, W. Va., on the evening of the 10th was westbound passenger No. 5. One passenger and four trainmen were injured. The derailment was caused by the breaking of a side rod of the locomotive.

The train derailed on the Philadelphia & Reading at Hellertown, Pa., on the 13th was a northbound freight, and twelve cars of ore were ditched. Two trainmen were injured.

The train derailed near Durbin, W. Va., on the evening of the 15th was a southbound passenger. The engine and three cars were badly damaged. Six passengers and one trainman were injured.

The train derailed near Troy, N. Y., on the 21st was a southbound local passenger, and the engine was overturned. The engineman was injured.

The train derailed near Rutland, Mass., on the 22nd was a westbound passenger. The fireman was injured. The derailment was due to a landslide, which was caused by a sudden heavy rainstorm.

The train derailed at Fitzpatrick, Ala., on the 23rd was a westbound passenger, and the engine and first two cars were overturned. The engineman was killed and three passengers and three trainmen were injured. The derailment is believed to have been due to soft track, following several days of heavy rain.

The train derailed near Goodnight, Colo., on the 24th was eastbound freight No. 84. A number of cars were ditched, and the wreck took fire, consuming eleven cars. On the train there were a number of trespassers, of whom one was killed and one injured. The derailment was caused by a broken wheel.

The train derailed near Cairo, W. Va., on the 29th was eastbound passenger No. 12, and the cause of the derailment is said to have been the spreading of the rails. The derailment occurred in a tunnel and eight cars ran off the track.

The train derailed near Willaha, Ariz., on the 29th was a southbound passenger. The fireman was killed and the engineman and one trainman were injured. The train broke through a bridge which had been weakened by a flood, and the engine and the baggage car were precipitated into the stream.

Electric Car Accidents.—A butting collision of interurban cars, one carrying passengers and the other a work car, at Youngstown, Ohio, on the 8th injured 13 persons. In a butting collision near Chicopee, Mass., on the 23rd one man was killed and 6 were injured.

¹Abbreviations and marks used in Accident List:

rc, Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc, obstr., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P, or Pass., Passenger train—F, or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

Railway Strike Ordered for September 4

President Wilson Addresses Joint Session of Congress to Recommend Legislation to Prevent Walk-Out

THE scene of activity in the railway wage controversy and the efforts to avert a nation-wide strike of train service employees was transferred to Congress on Tuesday of this week when President Wilson went before a joint session of the Senate and House and asked the enactment of legislation not only for the purpose of relieving the present situation but also as a remedy against the recurrence of similar problems.

This action was taken after the railway executives who had been in Washington for over a week conferring with the President had declined to accept the President's plan that they concede the eight-hour basic day without arbitration, but had offered a counter-proposal providing for an investigation of the questions involved by a special commission, and after the brotherhoods had practically terminated the negotiations without warning by issuing an order calling a strike for the morning of Monday, September 4, Labor Day.

Shortly after the President had presented his message to Congress most of the railway executives who had been in Washington left the city to return to their properties to make preparations for a strike if it should come.

In his address to Congress, President Wilson recommended the following legislation:

Provision for the enlargement and administrative reorganization of the Interstate Commerce Commission.

The establishment of an eight-hour day as the legal basis for both work and wages for railway employees in interstate commerce. The authorization of the appointment of a special commission to study the results in experience of an eight-hour day, its effect on operating costs and in other aspects, to report to Congress without recommendation.

Approval by Congress of the consideration by the Interstate Commerce Commission of an increase in freight rates to meet the additional expense should the facts justify the increase.

A provision for a public investigation before a strike or lockout may lawfully be attempted.

Lodgment in the hands of the President of power, in case of military necessity, to take control of the railways and to draft into service such train crews and officials as may be required.

In asking for this legislation the President also took occasion to make a public explanation of his course in the controversy.

The proposals for increasing the size of the Interstate Commerce Commission, for authorizing it to take the cost of wage increases into consideration in fixing freight rates, for an investigation by a special commission, and for the requirement of an investigation before a strike can be called are very closely in accord with suggestions made to the President by the railway executives. The suggestion for an eight-hour law has been advanced by the brotherhoods, but their leaders have given out public statements strongly opposing the plan for a compulsory investigation.

Tentative drafts of bills embodying the suggestions made by the President have already been made.

PROGRESS OF THE NEGOTIATIONS

As reported in last week's issue, a large number of the leading railway executives of the country had been in Washington conducting the negotiations with President Wilson since August 17. On that date the President asked the executives to confer with him after the National Conference Committee of the Railways had declined to accept his plan providing for the concession by the roads of the eight-hour

day and the postponement of all other issues pending an investigation by a special commission. Other executives arrived in Washington nearly every day for a week afterward until this week there were nearly 100 railway executives and managers, representing most of the railway mileage of the country, in the city. In addition to those mentioned last week, Samuel Rea, president of the Pennsylvania Railroad, Howard Elliott, president of the New York, New Haven & Hartford, and A. J. Earling, president of the Chicago, Milwaukee & St. Paul, have taken part in the conferences.

The basis of settlement proposed by the President at his first meeting with the National Conference Committee is in terms as follows:

"Concession of eight-hour day.

"Postponement of the other demand, as to payment for overtime, and the counter suggestions of the railway managers until experience actually discloses the consequences of the eight-hour day.

"In the meantime the constitution, by authority of the Congress, of a commission or body of men, appointed by the President, to observe, investigate and report upon these consequences, without recommendation.

"Then such action upon the facts as the parties to the present controversy may think best."

The principal developments during the first week of the negotiations were outlined in last week's issue.

After the executives had informed President Wilson that they could not accept his plan, and that they must insist on the principle of arbitration, almost continuous conferences were held by the sub-committee of eight, with Hale Holden, president of the Chicago, Burlington & Quincy, as chairman, in the effort to work out a feasible counter-proposition. This committee considered numerous plans, which were then submitted to the other executives and to the National Conference Committee for full discussion, while a special committee of three, consisting of Mr. Holden, Robert S. Lovett, chairman of the Union Pacific, and Daniel Willard, president of the Baltimore & Ohio, held several conferences with the President to discuss certain phases of the situation. While these conferences were pending Mr. Holden gave out a statement explaining that the executives were proceeding as rapidly as practicable with their work, but that the problem with which they were wrestling was the most important and gigantic ever presented to any body of men in the industrial history of the country, and that they could not consistently with their duty reach a final conclusion without much discussion, great study and profound thought.

All of the plans discussed, however, seemed open to serious objection. The President had insisted on the concession of the eight-hour day, as a basis for the computation of wages, "even where the actual work to be done cannot be completed within eight hours." Any plan embodying such a concession, using the present rates of pay for 10 hours, would involve an increase in wages, it was estimated by the conference committee of managers, of about 21 per cent, or approximately \$50,000,000 a year. The brotherhoods were unwilling to submit to arbitration the question of the rate of pay per hour on an eight-hour basis, and although the President in his statement to the public had suggested the possibility of an increase in rates if it were found necessary to meet the increased expense he could give no assurance of such a result.

The President's plan, moreover, gave no definite promise that it would effect a permanent settlement of the questions at issue. The proposed commission was to have no power except to investigate and report. There was no assurance that the brotherhoods, after having received the eight-hour basic day, would not repeat their demands for time and one-half for overtime, accompanied by a strike threat at some later

date, nor that, having had their pay increased by the change in the basis without any change in their hours of work, they would not return with a demand for a real eight-hour day.

Meanwhile the railroad officers and the President were receiving hundreds of telegrams from commercial organizations, shippers, manufacturers, farmers and individuals from all parts of the country protesting against the idea of increasing freight rates for the purpose of paying higher wages and also against any surrender of the principle of arbitration. A large proportion of the newspapers throughout the country were also supporting the position of the railways editorially.

The railway officers were also confronted with the problem of the effect of the concession of either the eight-hour principle or an increase in wages for the benefit of the train employees, or their other employees.

"I hope," said F. D. Underwood, president of the Erie, in a statement to the newspapers, "that the public does not think we are standing out against the payment of \$50,000,000 or even \$100,000,000. That is a mere bagatelle to what the proposal really means. Figure out what granting this \$50,000,000 to the four brotherhoods and other millions to other unions that will seek the eight-hour day will mean to the railroads in the next 20 years. Why, it means a sum that would make the national debt insignificant."

The difficulty of the problem was increased after President Wilson had held several conferences with Senator Newlands and Representative Adamson, the chairman of the congressional committees on interstate commerce, as a result of which it was indicated to the roads that there was little chance of obtaining new legislation at this session of Congress.

A new possibility was held out for a time about the middle of last week when the railroads were informed that the brotherhood leaders had indicated to W. L. Chambers, of the United States Board of Mediation and Conciliation, that they were willing to arbitrate the railroads' contingent proposals, regarding the elimination of certain arbitrary allowances in case of any change in the wage basis, which under the President's plan were to be postponed. On Thursday, August 24, Messrs. Holden, Lovett and Willard held a short conference with the President at the White House, at which they were informed that there had been a misunderstanding and that the brotherhoods would make no such concessions.

This left the situation as hopeless as ever and it was reported that the brotherhoods had told the President that they would not wait any longer than Saturday night for any counter-proposition from the railways. It was given out that "a new phase of the situation of some importance was being discussed and the railway executives held several more conferences.

On Friday noon a statement was given out by the railway executives saying that they were studying the form of a communication to the President and later in the day the special committee of three had another conference at the White House. After long meetings Friday evening and Saturday morning the railway executives agreed upon the form of a counter proposition to be made to the President, as a basis for a settlement, together with a final notice that could not concede the eight-hour day without arbitration.

The sub-committee of eight asked for an appointment with the President, but after they had waited for some time they were notified that the President could not see them until Monday morning. News of the nature of the new plan leaked out and was published in some of the newspapers on Saturday morning. Whether or not this affected the President's plans, in the afternoon he made a sudden trip to the Capitol and conferred with the Senate leaders on the subject of legislation. He was also understood to be in communication with the railway executives and members of Congress

through Franklin K. Lane, Secretary of the Interior, and a former member of the Interstate Commerce Commission. On Sunday the executives marked time while the President was reported to be active in conferences regarding proposed legislation which might effect a settlement and avert a strike. The President went to the Senate office building on Sunday afternoon and talked with Senator Kern, the Senate leader.

While many rumors were being circulated regarding the nature of the proposed legislation most of the 600 general chairmen who compose the brotherhood committee left Washington on Sunday evening for their homes, taking with them sealed orders and instructions for the carrying on of a strike. A sub-committee of 24, in addition to the four executives of the brotherhoods, was left behind with instructions, it was reported, not to accept any plan of arbitration.

STRIKE ORDER ISSUED

On Monday the railway officers learned that the sealed orders for a strike, which it had been understood were to be released by a cipher message giving the date, in fact carried instructions for the calling of the strike at 7:00 o'clock a. m., on September 4, Labor Day, and that the printed blank forms, on which the strike date had been filled in with a rubber stamp, bore the date of August 14, the day on which the railroad and brotherhood committees had been summoned to Washington by the President.

President Wilson had postponed his engagement with the railroad presidents from 10:00 a. m., until 2:30 p. m., on Monday. When the committee of eight called at the White House in the afternoon they did not present their counter-proposal, but instead suggested to the President the immediate enactment by Congress of a law similar to the Canadian Industrial Disputes Investigation Act, to prevent the calling of a strike before an investigation by the government. This suggestion was left with the President, but before leaving the committee pointed out to him that if the reports that the date for declaring the strike had been fixed for September 4, were true, it would force an early conclusion of the negotiations and compel the presidents to return to their properties to prepare for the issue. This was the first news President Wilson had that a strike had been called.

After another conference with the Democratic steering committee at the Capitol the President called the brotherhood leaders to the White House and asked them about the strike call. They acknowledged that the order had been issued for September 4, and declined his request that it be rescinded, saying that it was beyond recall.

RAILROADS MAKE COUNTER-PROPOSAL

Meanwhile the railroad officers made preparations for leaving the city and for meeting a strike. The fact that the brotherhoods had refused to recall the order was conveyed to the executives during the evening by the President's secretary and the executives and managers held a long meeting, to consider the entire situation. On Tuesday morning the sub-committee of eight again went to the White House and were advised that the brotherhoods had declined to accept the proposal made the day before for the enactment of a law requiring an investigation before a strike could be called. The railroad executives then submitted their formal proposal which they had expected to present on Saturday, providing for an account to be kept of the wages that would accrue to the men under both the eight-hour and the ten-hour bases, and for investigation of the entire subject by a commission. Soon after leaving the President they were informed that the brotherhoods had also rejected this plan whereupon the railway executives gave out a lengthy statement to the public of their convictions and of their plans submitted to the President for a peaceful settlement, including a summary by Chairman Holden, of the statement made to President Wil-

son at Monday's conference. This summary was as follows:

"We have been giving most earnest and respectful consideration to the suggestions of the President as to a means of avoiding the national catastrophe of the present strike. While our own minds are clear as to the facts and as to the consequences of granting the demands of the men, either as a whole or in substantial part, our statements have not been acquiesced in and our conclusions have been questioned.

"In addition, we have been met by a strong and insistent protest from shippers against any further effort to put on them in the shape of increased rates the financial burdens of an adjustment. Under these circumstances, it seems to us wise that there should be an investigation by some governmental authority—by a commission appointed by the President, by Congress itself or by any other means deemed appropriate by the President—of all the facts in the case, at which investigations the three parties in interest—the employees, the railroads and the public—shall be heard, and the facts reported without recommendation.

"When the facts are thus ascertained and beyond dispute, the railroads will be in a position to make prompt answer to the suggestions of the President and then answer can be measured by the ascertained facts. Meanwhile, it seems clear that the situation should remain unchanged and the disaster to the public interests, incident to an attempted interruption of commerce, should not be permitted by either party or by the government, it being understood that the interests of no party to the controversy shall be prejudiced by the delay.

"We suggest the enactment by Congress at once of a law within the policy of the Canadian Industrial Disputes Investigation Act, which in itself will furnish a guarantee against hasty action now and against the recurrence of such an unfortunate situation in the future. We call attention to the fact that the principles of the proposed act do not involve an impairment of the freedom of action of either party after the facts have been reported."

To this was added a statement of the formal proposition which had been made by the railroads, with their reasons therefor, as follows:

THE RAILROADS' FINAL PROPOSAL

"We are unable after the most earnest consideration to agree with the proposal of the President of the United States, which is that we accept without arbitration 'the substitution of an eight-hour day for the present ten-hour day in all of the existing practices and agreements.' This is the main point in controversy and we cannot surrender it without an opportunity to be heard in some form of fair arbitration.

"We do not assent to the statement that 'the eight-hour day now undoubtedly has the sanction of the judgment of society in its favor.' We believe that society has not yet recorded its judgment upon this subject.

"We are not in this controversy, however, dealing with the conditions relating to the eight-hour day in the industrial world. The difference between the eight-hour day in business and manufacturing interests and in the railroad train service day has been fully explained. The railroad day is a basis for computing pay and overtime, the length of daily service being controlled by variable conditions.

"The demands involved in this controversy have not been presented, in our judgment, for the purpose of fixing a definite daily period of labor nor a reduction in the existing hours of labor or change in methods of operation, but for the real purpose of accomplishing an increase in wages of approximately one hundred million dollars per annum, or 35 per cent, for the men in railroad freight train and yard service represented by the labor organizations in this matter.

"After careful examination of the facts and patient and continuous consultation with the Conference Committee of Managers and among ourselves, we have reached a clear understanding of the magnitude of the questions and of the serious consequences to the railroads and to the public involved in a decision of them.

"As trustees for the public served by our lines and for the great mass of the less powerful employees (not less than 80 per cent of the whole number) interested in the railroad wage fund—as trustees also for the millions of people that have invested their savings and capital in the bonds and stocks of these properties and who through the savings banks, trust companies and insurance companies are vitally interested to the extent of millions of dollars, in the integrity and solvency of the railroads of the country, we cannot in conscience surrender without a hearing, the principle involved nor undertake to transfer the enormous cost that will result to the transportation of the commerce of the country. The eight-hour day without punitive overtime involves an annual increase approximating in the aggregate sixty millions of dollars, and an increase of more than 20 per cent in the pay of the men, already the most highly paid in the transportation service. The ultimate cost to the railroads of an admission in this manner of the principle under contention cannot now be estimated; the effect upon the efficiency of the transportation of the country now already under severe test under the tide of business now moving, and at a time when more instead of less effort is required for the public welfare, would be harmful beyond calculation. The widespread effect upon the industries of the country as a whole is beyond measure or appraisal at this time, and we agree with the insistent and widespread public concern over the gravity of the situation and the consequences of a surrender by the railroads in this emergency.

"In like manner we are deeply impressed with the sense of our responsibility to maintain and keep open the arteries of transportation, which carry the life blood of the commerce of the country, and of the consequences that will flow from even a temporary interruption of service over the railroads, but the issues presented have been raised above and beyond the social and monetary questions involved, and the responsibility for the consequences that may arise will rest upon those that provoke it.

"The questions involved are, in our respectful judgment, eminently suitable for the calm investigation and decision by the public through the agency of fair arbitration, and cannot be disposed of, to the public satisfaction, in any other manner. The decision of a commission or board of arbitration, having the public confidence, will be accepted by the public and the social and financial rearrangements made necessary thereby will

be undertaken by the public but in no less deliberate nor orderly manner.

"The railroads of the country cannot under present conditions assume this enormous increase in their expenses. If imposed upon them, it would involve many in early financial embarrassment and bankruptcy and imperil the power of all to maintain their credit and the integrity of their securities. The immediate increase in cost, followed by other increases that would be inevitable, would substantially appropriate the present purchasing power of the railroads and disable them from extending and improving their facilities and equipment, to keep abreast of the demands of the country for efficient transportation service.

"For these reasons we are with deep regret unable to accept the suggestion made by the President of the United States.

"We propose, however, as a basis of settlement, the following:

"(a) The railroads will, effective September 1, 1916, keep the time of all men represented in this movement, upon an eight-hour basis and by separate account, monthly, with each man, maintain a record of the difference between the money actually earned by him on the present basis and the amount that would have been earned upon an eight-hour basis—overtime on each basis to be computed pro rata.

"The amounts so shown will be subject to the decision of the commission provided for in Paragraph (c) of this memorandum and payable in money as may be directed by said commission in its findings and decision.

"(b) The Interstate Commerce Commission to supervise the keeping of these accounts and report the increased cost of the eight-hour basis, after such period of actual experience as their judgment approves or the President may fix, not, however, less than three months.

"(c) In view of the far-reaching consequences of the declaration made by the President, accepting the eight-hour day, not only upon the railroads and the classes of labor involved directly in this controversy, but to the public and upon all industry, it seems plain that before the existing conditions are changed, the whole subject insofar as it affects the railroads and their employees, should be investigated and determined by a commission to be appointed by the President, of such standing as to compel attention and respect to its findings. The judgment of such a commission would be a helpful basis for adjustments with labor and such legislation as intelligent public opinion, so informed, might demand.

"The railroads will accept the findings of such a commission upon the issue of an eight-hour basis of pay as compared with the present basis, as well as upon any other matters now in controversy that may be submitted to it by either party.

"The commission should consist of not less than five members and should also be authorized to hear and determine all questions that may arise in the application of the findings of said commission or in the working out of such plan as it may propose.

"The presidents of the railroads are prepared to continue negotiations on the subject with genuine anxiety, within the limits of their conviction above expressed, to find a solution of the situation."

This statement was signed by 51 chairmen, presidents and vice-presidents.

FINAL STATEMENT OF RAILWAY EXECUTIVES

After having made their final proposal the railway executives prepared to leave the city and before evening most of them had gone. Before their departure they authorized the following statement of their position:

"The situation created through the issuance of the strike order by the brotherhoods makes it necessary that the railroad executives return to their homes to protect their properties in the emergency impending; as a consequence they are planning for an early departure.

"In leaving Washington they are unanimous in their expression of satisfaction with the results of their conference so far as the position of the railroads is concerned. Briefly summarized the important points developed by their deliberations here are:

"1. A renewed insistence upon the principle of arbitration as the only proper method of settling labor disputes. The railroads have given the employees every possible consideration in this respect, by offering to arbitrate their differences either through the Interstate Commerce Commission, under the Newlands Act, or by a commission to be selected by the President of the United States.

"2. An increased realization of the responsibility of the railroads toward their other employees, the shippers, the industrial, commercial and general public, which they have been made to feel by thousands of telegrams insisting upon the maintenance of their position.

"The railroad executives came to Washington upon the invitation of President Wilson, and in good faith have worked continuously and earnestly in a sincere effort to solve the problem in justice to all the parties at interest. These efforts were still in progress when the issuance of the strike order showed them to be unavailing. Responsibility for the threatened strike does not rest with the executives.

"The counter proposition made at the request of the Presi-

dent last week and presented to him formally today represents the unanimous sentiment of the railroads, and is the utmost concession to the demands of the men in the interest of peace which they feel able to make.

"Any other course would involve the surrender of a vital principle and impose undue burdens upon industry and commerce, impair railroad credit and prevent railroad progress to meet the rapidly increasing commercial demands of the country.

"The strike, if it comes, will be forced upon the country by the best paid class of laborers in the world, at a time when the country has the greatest need for transportation efficiency. The problem presented is not alone that of the railroad or business world, but one involving democracy itself, and sharply presents the question whether any group of citizens should be allowed to possess the power to imperil the life of the country by conspiring to block the arteries of commerce."

A BROTHERHOOD STATEMENT

The executives of the four brotherhoods, W. S. Stone, A. B. Garretson, W. S. Carter and W. G. Lee also issued a statement explaining their opposition to any legislation for a law similar to the Canadian act. They said:

"Since the abolition of slavery no more effectual means has been devised for insuring the bondage of the workingmen than the passage of compulsory investigation acts of the character of the Canadian industrial disputes act. The writers speak from their personal experience thereunder, as these organizations are all international in their jurisdiction. To cite an actual occurrence:

"In 1910 the men upon 80 railways in the eastern territory presented to the railway companies of that territory a demand for increase in wages. The companies refused to deal concertedly with the proposition, and it was therefore taken up with the individual roads. Three of the properties were Canadian, and two days after negotiation was opened, January 7, on the first road in the United States negotiations opened on the three Canadian properties. The negotiations in the United States included federal mediation in the first instance and arbitration in the third case.

"On the 19th day of July following, settlement was made on the last of the 77 American lines involved. On the same date, at 6 p. m., a strike took place on the Grand Trunk Railway, one of the Canadian railways, settlement not having yet been effected on any one of the three, this growing out of the delays which the employers were able to interpose under the industrial disputes act.

"Moreover, the period of investigation is eternally utilized by the employer to entrench himself in his effort to defeat the demands of the men, no matter how just their cause may be, and in a majority of instances where a verdict by an investigating commission has been favorable to the men it has been repudiated by the employer. In consequence of this attitude, disregard for and the ignoring of the provisions of that law has led to placing thousands of men in the attitude of lawbreakers, and the passage of laws which induce men to open violation thereof is a deadly injury to a nation because it breeds universal contempt for law.

"In the present strife, if such an act were passed, all that would be necessary would be for the power of attorney to be withdrawn from the national conference committee of managers by the individual roads to be created, or, if only a limited number were provided for, men would be compelled to remain for years in involuntary servitude if they obeyed the provisions of such a law."

The affairs of the railways in Washington, with reference to the strike situation, were left in the hands of the Railway Executives' Advisory Committee, of which Frank Trumbull, chairman of the Chesapeake & Ohio and of the Missouri, Kansas & Texas, is chairman, and of the National Conference Committee of the Railways, of which Elisha Lee, assist-

ant general manager of the Pennsylvania Railroad, is chairman. Most of the members of these committees had left Washington by Wednesday night.

President Wilson's address to Congress on the strike situation follows in full:

PRESIDENT WILSON'S ADDRESS TO CONGRESS

I have come to you to seek your assistance in dealing with a very grave situation which has arisen out of the demand of the employees of the railroads engaged in freight-train service that they be granted an eight-hour working day, safeguarded by payment for an hour and a half of service for every hour of work beyond the eight.

The matter has been agitated for more than a year. The public has been made familiar with the demands of the men and the arguments urged in favor of them, and even more familiar with the objections of the railroads and their counter-demand that certain privileges now enjoyed by their men and certain bases of payment worked out through many years of contest be reconsidered, especially in their relation to the adoption of an eight-hour day. The matter came some three weeks ago to a final issue and resulted in a complete deadlock between the parties. The means provided by law for the mediation of the controversy failed and the means of arbitration for which the law provides were rejected. The representatives of the railway executives proposed that the demands of the men be submitted in their entirety to arbitration, along with certain questions of readjustment as to pay and conditions of employment which seemed to them to be either closely associated with the demands or to call for reconsideration on their own merits; the men absolutely declined arbitration, especially if any of their established privileges were by that means to be drawn again in question. The law in the matter put no compulsion upon them. The four hundred thousand men from whom the demands proceeded had voted to strike if their demands were refused; the strike was imminent; it has since been set for the fourth of September next. It affects the men who man the freight trains on practically every railway in the country. The freight service throughout the United States must stand still until their places are filled, if, indeed, it should prove possible to fill them at all. Cities will be cut off from their food supplies, the whole commerce of the nation will be paralyzed, men of every sort and occupation will be thrown out of employment, countless thousands will in all likelihood be brought, it may be, to the very point of starvation, and a tragical national calamity brought on, to be added to the other distresses of the time, because no basis of accommodation or settlement has been found.

Just so soon as it became evident that mediation under the existing law had failed and that arbitration had been rendered impossible by the attitude of the men, I considered it my duty to confer with the representatives of both the railways and the brotherhoods, and myself offer mediation, not as an arbitrator, but merely as spokesman of the nation, in the interest of justice, indeed, and as a friend of both parties, but not as judge, only as the representative of one hundred millions of men, women, and children who would pay the price, the incalculable price, of loss and suffering should these few men insist upon approaching and concluding the matters in controversy between them merely as employers and employees, rather than as patriotic citizens of the United States looking before and after and accepting the larger responsibility which the public would put upon them.

It seemed to me, in considering the subject-matter of the controversy, that the whole spirit of the time and the preponderant evidence of recent economic experience spoke for the eight-hour day. It has been adjudged by the thought and experience of recent years a thing upon which society is justified in insisting as in the interest of health, efficiency, contentment, and a general increase of economic vigor. The whole presumption of modern experience would, it seemed

to me, be in its favor, whether there was arbitration or not, and the debatable points to settle were those which arose out of the acceptance of the eight-hour day rather than those which affected its establishment. I, therefore, proposed that the eight-hour day be adopted by the railway managements and put into practice for the present as a substitute for the existing ten-hour basis of pay and service; that I should appoint, with the permission of the Congress, a small commission to observe the results of the change, carefully studying the figures of the altered operating costs, not only, but also the conditions of labor under which the men worked and the operation of their existing agreements with the railroads, with instructions to report the facts as they found them to the Congress at the earliest possible day, but without recommendation; and that, after the facts had been thus disclosed, an adjustment should in some orderly manner be sought of all the matters now left unadjusted between the railroad managers and the men.

These proposals were exactly in line, it is interesting to note, with the position taken by the Supreme Court of the United States when appealed to to protect certain litigants from the financial losses which they confidently expected if they should submit to the regulation of their charges and of their methods of service by public legislation. The court has held that it would not undertake to form a judgment upon forecasts, but could base its action only upon actual experience; that it must be supplied with facts, not with calculations and opinions, however scientifically attempted. To undertake to arbitrate the question of the adoption of an eight-hour day in the light of results merely estimated and predicted would be to undertake an enterprise of conjecture. No wise man could undertake it, or, if he did undertake it, could feel assured of his conclusions.

I unhesitatingly offered the friendly services of the administration to the railway managers to see to it that justice was done the railroads in the outcome. I felt warranted in assuring them that no obstacle of law would be suffered to stand in the way of their increasing their revenues to meet the expenses resulting from the change so far as the development of their business and of their administrative efficiency did not prove adequate to meet them. The public and the representatives of the public, I felt justified in assuring them, were disposed to nothing but justice in such cases and were willing to serve those who served them.

The representatives of the brotherhoods accepted the plan; but the representatives of the railroads declined to accept it. In the face of what I cannot but regard as the practical certainty that they will be ultimately obliged to accept the eight-hour day by the concerted action of organized labor, backed by the favorable judgment of society, the representatives of the railway management have felt justified in declining a peaceful settlement which would engage all the forces of justice, public and private, on their side to take care of the event. They fear the hostile influence of shippers, who would be opposed to an increase of freight rates (for which, however, of course, the public itself would pay); they apparently feel no confidence that the Interstate Commerce Commission could withstand the objections that would be made. They do not care to rely upon the friendly assurances of the Congress or the President. They have thought it best that they should be forced to yield, if they must yield, not by counsel, but by the suffering of the country. While my conferences with them were in progress, and when to all outward appearance those conferences had come to a standstill, the representatives of the brotherhoods suddenly acted and set the strike for the fourth of September.

The railway managers based their decision to reject my counsel in this matter upon their conviction that they must at any cost to themselves or to the country stand firm for the principle of arbitration which the men had rejected. I based my counsel upon the indisputable fact that there was

no means of obtaining arbitration. The law supplied none; earnest efforts at mediation had failed to influence the men in the least. To stand firm for the principle of arbitration and yet not get arbitration seemed to me futile, and something more than futile, because it involved incalculable distress to the country and consequences in some respects worse than those of war, and that in the midst of peace.

I yield to no man in firm adherence, alike of conviction and of purpose, to the principle of arbitration in industrial disputes; but matters have come to a sudden crisis in this particular dispute and the country had been caught unprovided with any practicable means of enforcing that conviction in practice (by whose fault we will not now stop to inquire). A situation had to be met whose elements and fixed conditions were indisputable. The practical and patriotic course to pursue, as it seemed to me, was to secure immediate peace by conceding the one thing in the demands of the men which society itself and any arbitrators who represented public sentiment were most likely to approve, and immediately lay the foundations for securing arbitration with regard to everything else involved. The event has confirmed that judgment.

I was seeking to compose the present in order to safeguard the future; for I wished an atmosphere of peace and friendly co-operation in which to take counsel with the representatives of the nation with regard to the best means for providing, so far as it might prove possible to provide, against the recurrence of such unhappy situations in the future—the best and most practicable means of securing calm and fair arbitration of all industrial disputes in the days to come. This is assuredly the best way of vindicating a principle, namely, having failed to make certain of its observance in the present, to make certain of its observance in the future.

But I could only propose. I could not govern the will of others who took an entirely different view of the circumstances of the case, who even refused to admit the circumstances to be what they have turned out to be.

Having failed to bring the parties to this critical controversy to an accommodation, therefore I turn to you, deeming it clearly our duty as public servants to leave nothing undone that we can do to safeguard the life and interests of the nation. In the spirit of such a purpose, I earnestly recommend the following legislation:

LEGISLATION PROPOSED

First, immediate provision for the enlargement and administrative reorganization of the Interstate Commerce Commission along the lines embodied in the bill recently passed by the House of Representatives and now awaiting action by the Senate; in order that the Commission may be enabled to deal with the many great and various duties now devolving upon it with a promptness and thoroughness which are with its present constitution and means of action practically impossible.

Second, the establishment of an eight-hour day as the legal basis alike of work and of wages in the employment of all railway employees who are actually engaged in the work of operating trains in interstate transportation.

Third, the authorization of the appointment by the President of a small body of men to observe the actual results in experience of the adoption of the eight-hour day in railway transportation alike for the men and for the railroads; its effects in the matter of operating costs, in the application of the existing practices and agreements to the new conditions, and in all other practical aspects, with the provision that the investigators shall report their conclusions to the Congress at the earliest possible date, but without recommendation as to legislative action; in order that the public may learn from an unprejudiced source just what actual developments have ensued.

Fourth, explicit approval by the Congress of the consideration by the Interstate Commerce Commission of an increase of freight rates to meet such additional expenditures by the railroads as may have been rendered necessary by the adoption of the eight-hour day and which have not been offset by administrative readjustments and economies, should the facts disclosed justify the increase.

Fifth, an amendment of the existing federal statute which provides for the mediation, conciliation, and arbitration of such controversies as the present by adding to it a provision that in case the methods of accommodation now provided for should fail, a full public investigation of the merits of every such dispute shall be instituted and completed before a strike or lockout may lawfully be attempted.

And, sixth, the lodgment in the hands of the Executive of the power, in case of military necessity, to take control of such portions and such rolling stock of the railways of the country as may be required for military use and to operate them for military purposes, with authority to draft into the military service of the United States such train crews and administrative officials as the circumstances require for their safe and efficient use.

This last suggestion I make because we cannot in any circumstances suffer the nation to be hampered in the essential matter of national defense. At the present moment circumstances render this duty particularly obvious. Almost the entire military force of the nation is stationed upon the Mexican border to guard our territory against hostile raids. It must be supplied, and steadily supplied, with whatever it needs for its maintenance and efficiency. If it should be necessary for purposes of national defense to transfer any portion of it upon short notice to some other part of the country, for reasons now unforeseen, ample means of transportation must be available, and available without delay. The power conferred in this matter should be carefully and explicitly limited to cases of military necessity, but in all such cases it should be clear and ample.

There is one other thing we should do if we are true champions of arbitration. We should make all arbitral awards judgments by record of a court of law in order that their interpretation and enforcement may lie, not with one of the parties to the arbitration, but with an impartial and authoritative tribunal.

These things I urge upon you, not in haste or merely as a means of meeting a present emergency, but as permanent and necessary additions to the law of the land, suggested indeed, by circumstances we had hoped never to see, but imperative as well as just, if such emergencies are to be prevented in the future. I feel that no extended argument is needed to commend them to your favorable consideration. They demonstrate themselves. The time and the occasion only give emphasis to their importance. We need them now and we shall continue to need them.

STRIKE INSTRUCTIONS

The instructions for the strike, sent to all members and officers of the four brotherhoods, order that no man in road service involved in the strike shall perform any service after the hour set, unless he has already begun a trip and actually left the terminal, in which case he is to complete the trip. Men in other than road service are to leave the service at the appointed time. All men on strike are ordered to keep away from the company's property except those "assigned to certain duties by order of the organization." Local representatives are directed to arrange for halls for meetings to be held twice a day for the election of officers for a joint organization of the four brotherhoods and for roll calls twice a day.

Among the other instructions are the following:

"So far as your legal right to strike is concerned, there is no difference between a mail train and a freight train. You have identically the same right to refuse to perform service

on a mail train as you have to refuse to perform service on a freight train.

"Every man should understand that the laws of the land must be obeyed. Acts of violence of any nature will not be tolerated by the organizations."

The grand officers of the four organizations are to be assigned to certain districts and will have general supervision over the strike in those districts. The general chairman will be responsible for the conduct of the strike on their railroads while the local chairmen will have jurisdiction over divisions.

Officers of many roads in various parts of the country have announced their intention of attempting to run trains in spite of the strike and many have said that they will have a very considerable number of men at work. Plans for the operation of service during the strike have been worked out in detail by individual roads, many of whom have been preparing for a long time in advance. It has been planned to give special attention to milk trains and trains carrying other food products.

The National Conference Committee has made some general suggestions to the various roads, such as that they prepare against a possible congestion of their yards and lines by turning over as much freight as possible to connecting lines in advance and making every effort to clear up all accumulations of freight, but in general the conduct of the strike will be left to the managements of the roads themselves. Some roads have already declared partial embargoes.

VIEWS OF RAILWAY EXECUTIVES

While the negotiations between President Wilson and the railway officers and brotherhood representatives regarding the proposed strike of the train employees have been pending at Washington, both sides have issued numerous statements to the public explaining various phases of the controversy. Some extracts from statements made by railway executives are as follows:

SAMUEL REA

Samuel Rea, president of the Pennsylvania Railroad, said in part:

"For the managements of the railways to yield to the demands and threats of the labor organizations, and to accept President Wilson's proposal, would be to destroy at one blow the principle of arbitration as the paramount and recognized method of settling labor disputes. What would be gained by this tremendous sacrifice of sound principle which involves the rights and interests of the railways, of the great majority of their employees not embraced in the present controversy, and of the American people? The threatened strike would be postponed, it is true, but we would have no assurance that it would be permanently prevented. Except that the principle of an eight-hour pay day would be conceded, the issues of the very controversy now pending would be left unsettled, while the future of the railways would indeed be rendered dark and uncertain.

"These, in brief, are the reasons why the heads of the railways, with a full appreciation of the solemn and weighty responsibility resting on them, as well as of their duty to the public and to their shareholders, have been forced to the conclusion that it is better to face the alternative of a strike than to surrender.

"The great labor movements culminating in the present one began a decade ago, almost simultaneously with the adoption of effective regulation. From that time the managements have been engaged in a desperate struggle to prevent and completely stop their development. After the first large increase in wages was made, appeal was made to the Interstate Commerce Commission for advances in rates, which the commission in 1911 denied. Even in the face of this, railway managers were undaunted and in good faith applied all their

energy and ability to increasing efficiency. Never in the history of any industry was more hard, conscientious, able and successful work done to increase efficiency than has been done on the railways of this country during the last ten years.

"What has been the result? The labor movement has continued, and one arbitration board after another has awarded advances in wages. In spite of increased efficiency the companies could not stand the strain, and in 1914 again appealed to the Interstate Commerce Commission. This time the Commission decided that their earnings were not adequate, and granted some advances in rates, but before this relief was accorded there were more miles of railway in the hands of receivers than ever before, and new construction had reached the lowest ebb since the civil war.

"This period of profound depression has been followed by a year of comparative prosperity in the railway business, due almost entirely to an abnormal increase in traffic which it is recognized cannot be permanent. And now, after this brief period of prosperity, it is proposed that the roads shall make sacrifice of principles and grant wages which would cause an increase in expenses that would wipe out all of the advances in rates that have been granted and sweep away the economies that have been achieved by the exertion of ten years.

"The railways know that if they yield to the present demands of a comparatively small percentage of the total numbers of their employees they will receive like demands from the rest, and that these concessions to all employees will cost at least \$200,000,000 and probably \$300,000,000 a year. They know, too, that if they submit now to the proposition made to them by the President they will be denounced by the business interests of the country for having given up the principle of arbitration when every factor in the dispute points to the justice of their cause.

"Confronted by such conditions, and borne down by a solemn sense of their responsibility to their employees, to business interests of all kinds, to the one hundred million people of the United States, and to their stockholders, what could the heads of the railways do but refuse to yield, and then calmly but resolutely face the possibilities of the situation in full confidence that their action will receive the unqualified endorsement and support of the business interests of the country and the public at large, who have as yet been denied all opportunity to be heard."

L. F. LOREE

L. F. Loree, president of the Delaware & Hudson, gave out an interview in which he said:

"President Wilson has laid great stress on the condition in which the country was likely to find itself at the end of the European war; that we would then be exposed to the sharpest competition known in the history of the country; and that everything ought to be done that could possibly be done to prepare ourselves for this industrial conflict. As a means of doing so, he has urged that we come to an accommodation with the trainmen, whose demand for an increase of 35 per cent in their wages has been refused by the National Conference Committee of Managers by the acceptance of his suggestion of a *modus vivendi* carrying with it an increase of 20 per cent in wages. Owing to the incidence of the two plans, the amount of the additional expense would be in the first case \$100,000,000 and in the second case \$50,000,000 and whether borne directly by the railroads or passed on as he suggested to the producers must add to the cost of production.

"The end of the European war will mean the end also of our extraordinary exports and the return to normal. It will mean keen competition in those foreign markets which we now hold. To hold even normal exports we must be prepared to meet prices lower than we have ever had to compete against.

To do so we must reduce our cost of production to a minimum. Are we going to prepare for competition by further increasing wages and substantially increasing the cost of production?

"Are we preparing to hold our home markets when the war is over and imports increase? Germany and Austria are today selling no goods in our market. Will they not make a tremendous effort to regain their old position when peace is declared. It is obvious that they will. It is also obvious that the other nations now at war with them will fight for the American market. If the present tariff is maintained, what is going to be the effect on our manufacturers? Can they hold even their own markets with the present abnormal cost of production in this country?

"During the fiscal year ended June 30, 1916, with the war in Europe at its height, imports into the United States amounted to \$2,197,883,510. During the fiscal year 1913, the last year of the Payne tariff law, imports were \$1,813,008,234. Thus the imports in 1916 were \$384,875,276 greater than in 1913, and during 1916 Europe was ablaze with war, shipping was limited and two of the greatest competitors in our home market were doing nothing. How much will imports increase during the twelve months succeeding the declaration of peace? What must we do to meet this competition? Assuming a continuance of the present tariff it is plain that we must reduce sharply our cost of production.

"Is this the time, therefore, to take a step which will sharply increase the cost of production? Is an increase of 21 per cent in railroad wages without increased efficiency or increased productivity a step in the direction of that preparedness which the President is seeking?

"The evil effects of conceding an increase in wages of 21 per cent is not fully measured by the injury to the roads or to the manufacturers by the increased cost of operation or production thus imposed. It will inspire industrial unrest and demands for similar concessions throughout all industry.

"According to the census there are at present about 30,000,000 workers in the United States, including all over the age of ten. Figures submitted by the secretary of the American Federation of labor shows that in 1912 there were about 1,847,000 persons working under an eight-hour basis in the United States, and of this number 475,000 were either federal, state, county or municipal employees. Therefore, at that time there were less than 1,400,000 of the general workers of the country operating on an eight-hour basis and about 28,000,000 whose hours ranged from nine to twelve. Is it difficult to figure the loss in productive energy of this country if these 28,000,000 workers were put on an eight-hour basis? The increase in production cost would paralyze our competitive power. But this is the possibility raised by the President's demand that the railroads shall ignore the cost and grant a 21 per cent increase in wages to their highest paid employees, on the theory that the eight-hour day is a social concept. I have not dwelt on the fact that the men want an eight-hour day merely to compel the payment of overtime. The public understands that by this time.

"There is the additional problem of revenue. I have quoted the figures showing that in 1916 there was an increase in imports of \$384,875,276 over 1913. But comparing customs receipts we find that there was a decrease in 1916 from 1913 of \$107,025,173. This decrease was in part made up by \$83,000,000 collected under the war tax. On the conclusion of peace this war tax is to be repealed. It is said that it will be made up from increased customs receipts. The increase would have to be approximately 40 per cent. Total imports in 1916 were almost \$2,200,000,000. An increase of 40 per cent would mean additional imports of \$880,000,000. Do not these figures suggest competition and the necessity of preparedness, particularly of industrial preparedness?"

HOWARD ELLIOTT

President Howard Elliott of the New York, New Haven & Hartford, said:

"Personally, as well as officially, I have believed and I still believe that a question of such great importance as the eight-hour one should be settled only after all its aspects have been carefully considered by a tribunal free from prejudice and partisanship. The 100,000,000 of our people can have, of course, the kind of laws, working hours, and railroads they desire; also, if they want growing and efficient railroads, and believe they can have them on the basis of an eight-hour day they must be willing to pay the bills. The danger is that the people will not be willing to continuously pay higher rates for transportation and in that event the development of the railroad systems of our country will be checked. With a decline in our railroad development all other industrial as well as agricultural growth will be checked. To my mind the true patriotic policy for the welfare of the whole country at this time is for every man to do all he can to advance its growth rather than to check it and to reduce its output. We are far behind other countries in many ways and we have a great task before us in the next ten years to keep our proper place in the world. I hope, therefore, very much that in the interest of all our 100,000,000 people some solution of the present situation may be found, rather than it should be settled off-hand and solely in the interest of the 400,000 who are now pressing their demands."

E. P. RIPLEY

"There would be no trouble about granting the train service employees an eight-hour day of eight hours," said E. P. Ripley, president of the Atchison, Topeka & Santa Fe. "A good many people have given support to the brotherhood leaders in the belief that the latter are fighting to establish the principle of the eight-hour day. Speaking for myself only, I do not hesitate to say that if the brotherhoods would indicate that they are willing to work eight hours for a day's pay, this controversy could be settled in twenty minutes. What the brotherhood leaders have said to the public is not in tune with the demands they made of the managers' committee. They tried to give the public to understand that they were endeavoring to establish an eight-hour work-day. Of the managers' committee they demanded pay for eight hours for work done in less than that time—seven, six, five and as short a period as three hours, with time and a half for service performed after eight hours. The brass tacks of the situation is this: Let the men declare for an eight-hour day of eight hours work, and I will take off my hat and coat and put in my best licks for their cause."

JULIUS KRUTTSCHNITT

Julius Kruttschnitt, chairman Southern Pacific, said in part: "The President's proposition that the railways grant the eight-hour day demanded by the employees and that their demand for time and a half for overtime and other questions be submitted to arbitration, reminds us of the settlement proposed by a common friend to two men who quarrelled about the ownership of a terrier, that the dog be turned over by the recognized owner to the claimant, who stubbornly refused arbitration, and that the claimant's title to the tail be made the subject of future arbitration."

"The railways believe that the eight-hour day as understood by the employees is extremely unfair to the carriers. They believe its adoption would unduly favor a class who are now the highest paid workingmen in America, and place an unreasonable burden on the railways, and an unreasonable burden of increased rates on the public, which ultimately would have to pay the bill. There can be no social or economic justification for fixing a basis of wages which would enable men in train service to earn a day's wage for an average of much less than eight hours' work. The railway employees know, the railway managers know, and the public

ought to know that train employees are asking for an enormous increase in wages in return for a counterfeit eight-hour day."

FAIRFAX HARRISON

Fairfax Harrison, president of the Southern Railway, said today: "I gave my individual adherence to the unanimous determination of the railway presidents recently in conference in Washington only after taking the advice of many representative men in various walks of life in all parts of the South, and with all other manifestations of public opinion of the South constantly in view. I include in this my knowledge that the employees of the Southern Railway who are involved, and who still have my respect and whose welfare is of the utmost personal concern to me, have not had reason to be, and in fact have not been, discontented as a class. I did not take action hastily or with prejudice, but after my own best and most deliberate judgment and with full consciousness of my responsibility. The easiest course would have been to have accepted the proposals made to the railways; to have waived the principle of arbitration and to have imposed a heavy, new, and, in my opinion, unnecessary burden on southern commerce, with the inevitable consequence of postponement of the full development of the railways for the largest service of the whole people of the South. There are some who believe that immediate and temporary peace at such a price is desirable. I am not one of them, though God knows I am for peace, and have no illusions as to what industrial war means when threatened on the scale of the present crisis. In my judgment the time has come to test again whether the American people are to be governed by unregulated force or by law. I risk my own reputation on that issue, and I count on the support of all sound and conservative opinion in the South to counsel patience and endurance of temporary inconvenience while the test is being made. The decision must lie with deliberate and advised public opinion crystallized in law. Whatever it may be when so declared, I will, of course, abide by it."

THE SITUATION IN WASHINGTON

President Wilson held conferences Tuesday evening with the leaders in Congress of both parties. Wednesday the Senate Committee on Interstate Commerce held a meeting to consider the legislation proposed by the President and adopted a resolution providing for a hearing Thursday at which the brotherhoods, railway officers and shipping and other public interests would each be given three hours.

Tentative drafts of proposed bills were laid before the committee. One bill provides that beginning on a date to be fixed eight hours shall be deemed standard for a day's work for purpose of reckoning compensation; also for the creation of a commission to be appointed by the President, one member of which shall be recommended by railways and another by the employees to study the working of the eight-hour day in effect and report to President and Congress. The report to be transmitted to the Interstate Commerce Commission, which shall accept the findings of the wage commission unless clearly erroneous and reach a decision as to what extent the change in the standard work day necessitates an increase in freight rates. Pending these investigations the compensation of the employees shall not be reduced below the standard day's wage at present and for all overtime pro rata rates shall be paid. The wage commission also to report whether in its opinion power to fix wages of railway train employees ought to be vested in some public body. The penalty for violation of the section prohibiting the reduction of wages to be \$100 to \$1,000. Another bill proposes an amendment to the present mediation arbitration law to provide for compulsory investigation in advance of a strike and provides a penalty for strike or lockout pending investigation. The third bill empowers the President to take over the operation of the roads when in his judgment it is necessary for military purposes.

Senator Blair Lee of Maryland on Wednesday introduced the following resolution, which was referred to the Senate Interstate Commerce Committee:

Resolved, That in order to afford sufficient time for the intelligent consideration of the legislation in the President's message to Congress on August 29, the Senate of the United States hereby requests the representatives of the railroad employees who have fixed September 4 for the commencement of a general strike, to postpone the date for the beginning of such strike for one week, and that a copy of this resolution be immediately forwarded by the Secretary of the Senate to the said representatives having the matter of a strike in their charge.

Senator Lewis introduced a resolution Wednesday providing for a reorganization of the Interstate Commerce Commission and authorizing the railroads to apply to the commission for rate increases to meet the cost of increases in wages.

House leader Kitchin and Chairman Adamson of House committee interstate commerce have made plans for legislation in the House.

R. T. Frazier Jr., who has secured 105,000 signatures to the petition to the President on behalf of the unorganized employees asking him to avert a strike, has written a letter protesting because only the train employees are included in the proposed eight-hour law.

While railroads were striving to prepare for the strike, manufacturers of the Middle West gathered in Chicago in an eleventh hour attempt to find means of averting it. At a conference called by the Illinois Manufacturers' Association and attended by representatives of similar associations from many states, resolutions were introduced urging that President Wilson insist on the principle of arbitration. A committee of fourteen has gone to Washington to present the resolution to President Wilson.

PREPARATIONS FOR THE STRIKE

As soon as it became evident that a strike was imminent the railways, as well as the public, hurried to make final preparations for it. Passenger traffic is usually exceedingly heavy at this season because of returning vacationists. Indications were that it would be much lighter in the east this year because of the infantile paralysis epidemic and the delayed school openings. To offset this, however, business houses are ordering their representatives home and the railways generally have warned travelers that they will be liable to more or less inconvenience and delay after 7 a. m. next Monday morning.

Thirty presidents of roads centering in Chicago gave out the following statement Wednesday:

"To the Public: In view of the announcement of certain employees of this company to engage in a strike, to become effective at 7 a. m. Monday, September 4, agents are hereby instructed:

"First, to notify intending travelers that the company will not be responsible for any delays that may occur after the time above mentioned.

"Second, to notify all shippers that perishable freight only will be received, and that subject to delay, and all bills of lading will be endorsed accordingly.

"Third, it will be the purpose of the company, so far as it may be in its power to do so, to provide transportation necessary for the health and subsistence of the communities dependent upon it.

"Fourth, to move at least one train each way daily for the transportation of passengers, mail and express.

"Fifth, to gradually expand these activities, so far as may be practicable.

"Agents have been advised to notify all parties interested in accordance with the foregoing programme and will notify officers of municipalities that the ability to carry out our present intentions will be largely dependent on their willingness and ability to afford protection to the company and its property in so doing."

FREIGHT EMBARGOES

As early as Tuesday the New Haven gave notice of an embargo on freight which could not be delivered at destination at such a time on September 3 as to permit placing before the 4th. An exception was made of fuel, supplies and material

for the operation of the railroads. In arranging for delivery of freight now on the road or at junction points, preference is being given to live stock, perishables and foodstuff for human consumption.

The Pennsylvania announced Wednesday afternoon that an embargo had been placed on all freight shipments over its own and allied lines. The embargo affected explosives and inflammables beginning Thursday, perishable freight beginning Friday, and all other freight beginning Saturday. As soon as practicable after Labor Day the embargoes will be modified to permit resumption of the movement of foodstuffs and perishable freight. It was stated that "the purpose of the embargoes is to clear the lines up as far as possible so that congestion and confusion will be avoided at the opening of the strike, and the management will have the best possible opportunity to reorganize the service with the greatest practicable speed."

The Pennsylvania statement referred to express shipments in the following words: "The management of the Pennsylvania Railroad has notified the Adams Express Company that after today all shipments over the lines of the Pennsylvania Railroad must be accepted subject to delay, and that no live stock or perishables should be accepted that cannot be delivered on or before September 2. Notice is also given that developments of the next day or two may determine whether or not it will be necessary to place express shipments under a complete embargo, pending the result of the strike call.

The Atchison, Topeka & Santa Fe Railway on Tuesday placed an embargo on all shipments of perishable goods and live stock, effective at once. The order also stated that the company will not take the responsibility on other shipments.

The Southern Pacific Steamship Company decided Wednesday not to accept any perishable merchandise, and that all other freight be taken subject to considerable delay. Ships of the line connect at Galveston, Texas, with rail service from the Pacific Coast over the Southern Pacific.

Similar embargoes have been declared by the other roads, many of them refusing perishable freight which will not reach its destination by Saturday.

The Lehigh Valley announced on Wednesday: "At the moment we do not contemplate shutting off the general movements of freight in anticipation of trouble. Should there be a considerable interruption in train service, our first thoughts will be regarding the milk supply of New York City and near-by towns. No effort will be spared to continue our part of the service of transporting milk to the city. Second only to the milk will be the prompt movements of food for human consumption, and then food for public purposes. Such passenger trains as may be necessary will be operated, but milk and food will come first."

WARNINGS TO EMPLOYEES

The railroads generally have issued warnings to their employees against striking. The Erie statement, among other things, includes the following paragraphs:

To those employees who have to decide what their action will be in response to the call to strike it is fair to say that this company's purpose will be as follows:

Employees who remain continuously in the service will be placed at the head of the respective service rosters in the order of their present relative position thereon and will hereafter be considered the senior employees of the company.

Employees who join in the strike do by such action leave the service of the company, and in so doing all rights and privileges as employees cease.

Employees who leave the service may reënter same only at the option of the division superintendent, and then only as new employees; their position on the roster dating from the date they are permitted to resume duty. Before again entering the service they will be required to pass the physical examination prescribed for new employees, and will also be required to pass the examination on rules as prescribed for employees of the class of service which they enter.

President E. P. Ripley, of the Santa Fe, issued a statement to employees on Wednesday, notifying them that the places of those who failed to report for work next Monday would be declared vacant, and that employment of new men would be permanent, barring ill behavior. He notified

those who obey the strike order that they would lose all rights of seniority and benefits from insurance and pensions.

INJUNCTION AGAINST STRIKE

Judge Willis E. Sears, of the District Court of Douglas County, on Wednesday issued an order restraining the general and local officials of the Order of Railway Conductors calling or enforcing a strike on the lines of the Union Pacific. The order was issued on petition of Edwin A. Hamilton, a conductor on the Union Pacific and a member of the Order of Railway Conductors, who declares that he and many other employees of the road are anxious to continue at work. Hearing on the petition for a permanent injunction was set for September 2. One of the brotherhood leaders is reported to have said that: "The strike order is issued, and the court's injunction is not retroactive. The Union Pacific men will go out if the other men do."

THE FOOD SITUATION

The authorities in the larger cities are greatly disturbed over the food supplies. The police department in New York City is canvassing the situation to determine the exact amount of provisions on hand or available, and has also taken steps to prevent extortion if food becomes scarce. Motor trucks in conjunction with boat service may prevent conditions from becoming acute.

General Funston is reported to have said that the border troops are provisioned for 60 days ahead, but that forage for the horses and mules would soon be exhausted. The War Department has rushed food and provisions southward in large quantities since the strike situation has become threatening. Picking of California deciduous fruits for Eastern shipment was practically discontinued Tuesday because of the threatened strike.

MOTOR CARS FOR THE EMERGENCY

Plans are being made to use motor trucks for many classes of traffic between nearby cities, and even for long distances. Pittsburgh shippers, for instance, are said to be looking to motor trucks to solve many of their troubles, particularly those handling provisions and produce, while some of the more important war munition factories were said to have arranged for motor truck lines to carry their completed shells to the nearest points on Lake Erie, where they can be sent to Canada by water, and from there to Europe.

DETAIL ARRANGEMENTS

Each road is making detail preparations to operate trains and protect the property in accordance with its facilities and the local conditions. Many employees from other branches of the service and former employees have volunteered their services. Pensioners who are in physical condition to do service have also been called in some cases. As fast as possible these men are being examined and coached and instructed in the duties which they will be called upon to perform.

Both the railroads and the brotherhoods published large display advertisements, stating their respective positions, in Thursday's newspapers.

FREIGHT HANDLERS STRIKE AT CHICAGO

Freight handlers employed by railways entering Chicago have been ordered to strike by their union. A few hundred struck as early as Monday, others followed Tuesday; by Wednesday afternoon over 1,000 had quit on a general order. Only two roads so far are exempt, the Rock Island and Monon having conceded the demands. The roads affected say no interruption to business will result and that they are prepared. Those lines having men out are the Burlington where the trouble originated, 450; Baltimore & Ohio, 200; Grand Trunk, 150; Soo, 125; Lake Shore, 100; Nickel Plate, 100. The cause of the strike was the refusal of the railways to permit the business agent of the union to collect dues and solicit membership in working hours. The union claims 6,000 men will eventually go out. The roads say no more men will follow and the situation will adjust itself.

A DESK TO HOLD 12,000 CARDS

The desk herewith illustrated is one in use by a card-index clerk in the stores department of the Pittsburgh Railways Company, Pittsburgh, Pa., and by means of which the work of filling out and keeping track of the cards has been materially cheapened in cost. J. E. Wharton, chief clerk in the Stores Department, who sends us the photograph, says:

"Previous to the summer of 1915, it had been our practice to maintain our price records on cards, in a 16-drawer filing section. When this work was first started, one man had been doing the work, which consisted of pricing requisitions for material issued to the shops, and manifests covering material shipped to points on the road. One man took care of the pricing and also helped with other work in the office; but as business increased it became necessary to give him some assistance at certain periods of the month.

"In the early summer of 1915 we were also confronted with a lot of additional work, that of pricing requisitions for a shop cost system, and also for a way department cost system. At first our only recourse seemed to be to hire an additional clerk, but our first effort was to make sure that our system was just what it should be, and after considerable thought we put the cards into the desk, shown in the illustration.

"The space directly in front of the clerk had always been used for drawer room and writing purposes; but we utilized this, as shown in the picture, and thus made it possible for



Desk for Card Catalogue

the clerk to reach and work with all of the records contained in the desk without getting up from his chair. Under the old system it was necessary for the clerk to stand at the card file when pricing, and, on account of the cards being in a closed file, it was necessary constantly to keep opening and closing the drawers and to walk back and forth in front of the cases. This was not only slow and very inconvenient, but the continual opening and closing of the drawers wore out the index cards, and as a consequence the file was always more or less untidy. "With this special desk we were able to get all of our price records in one desk, the desk having a capacity of approximately 12,000 cards; and we take care of the increased amount of work, without increasing our clerical force. The price clerk is able to take care of all of our pricing and spend a portion of the day helping out with the other work.

"There are approximately 5,000 new prices posted on the cards from shippers' invoices each month, and approximately 20,000 items priced from the cards during the month. Figuring an average on the 20,000 items, based on 25 working days in a month, at nine hours a day, would make an average of about 89 items an hour, or 1.5 items a minute. As it is not necessary that the clerk spend all of his time each day on pricing, our average would be considerably higher.

"From our experience we believe that the ordinary price books, loose-leaf or otherwise, cannot be compared with the card system and the open desk."

W. C. NIXON

Following the incorporation of the new St. Louis-San Francisco Railway to succeed the St. Louis & San Francisco Railroad, a temporary board of directors was elected which chose the following officers: W. C. Nixon, president; W. B. Biddle, first vice-president; E. D. Levy, second vice-president and general manager; N. M. Rice, third vice-president, and C. W. Hillard, fourth vice-president.

The new St. Louis-San Francisco Railway will have an authorized capital stock of \$450,000,000, of which \$200,000,000 will be 6 per cent preferred and \$250,000,000 common stock. At present only \$7,000,000 will be issued of the preferred, and only \$48,480,000 of the common. The bonded indebtedness of the company for the present will total \$117,882,500, exclusive of equipment trust certificates amounting to \$5,306,000. In addition to these there will be bonds amounting to \$75,739,818 on which there will be contingent interest charges. The total issued capitalization, inclusive of the bonds on which there are contingent charges, will be \$264,408,318, as compared with a capitalization for the old company of \$302,076,386. The fixed charge obligations on the bonds and equipment trusts, and for rentals and sinking funds, will total \$6,341,069. There will also be \$2,817,120 representing fixed charges in connection with the Kansas City, Fort Scott & Memphis bonds, rentals, sinking funds, etc., or a total in fixed charges of \$9,158,190. The contingent charge obligations total \$4,544,389; or, in other words, there will be fixed and contingent charges together of \$13,702,579. The total fixed charges alone of the old company were \$14,886,325. It will show further how the new company should succeed in solving its problem, to note that the gross income of the St. Louis & San Francisco in the fiscal year ended June 30, 1915, was \$11,670,767; in the year ended June 30, 1914, \$10,158,945; and in the four years from 1912 to 1915, inclusive, an average of \$12,029,918. The operating income in the fiscal year ending June 30, of this year, was \$13,434,112.

Mr. Nixon, as president, will be able to count most upon the good will, and, one might say, habit of co-operation of the officers and employees who have worked with him. Under the direction of Mr. Nixon as chief operating officer, W. B. Biddle, as chief traffic officer, and Judge James W. Lush—these three being the receivers—a remarkable record was made in improving and bringing up the standard of the property which was entrusted to them. Not much money was available, and it was early realized that it would be necessary to improve the efficiency of operation and effect marked economies in order to secure from the earnings sufficient to put the property on a substantial condition for safe and profitable operation. In other words the problem was a man problem, coupled with the conservation and better use of materials. These men thoroughly believed that the average

employee was anxious to give his best efforts, and that the problem was largely one of educating him as to exactly what was required. Then, too, cheerful, satisfied employees could be a large factor in cultivating the public and getting it to see the railroad's side of the question—and public opinion did not greatly favor the railroads of the Southwest when the receivers took charge. Readers of the *Railway Age Gazette* are already familiar with what the receivers have accomplished.

Striking progress has been made in car and train loading. Although the average tractive effort of locomotives increased 22 per cent in the nine years prior to 1915, the average revenue train load was increased nearly 41 per cent. This showing, and the reductions in operating expenses brought about thereby were largely the result of an organized campaign in which everybody concerned was reached by educational meetings, and his interest aroused by the encouragement of co-operation and friendly rivalry.

The Frisco agency plan, started in the spring of 1912, is, in its simplest terms, a plan to recognize the importance of the station agent. The theory is to make the agent the railroad's representative at his station. In fact he is given opportunity under the guidance of an assistant on the staff of the division superintendent to prove his ability as a business promoter, claim agent and general manager in his territory.

Economical locomotive performance has received considerable attention on nearly every railroad. Wise and careful supervision of this matter on the Frisco resulted in a saving of almost \$1,000,000 in three years of operation.

The Frisco is one of the relatively small number of roads on which the handling of freight loss and damage claims is an operating matter. It started a campaign to reduce this waste at

a time when freight claim payments were running at almost \$490,000 yearly, or at a ratio of 1.67 per cent of the gross freight revenue, and when payments figured out at about \$17 per \$1,000 revenue. The educational campaign started with the slogan of "A \$100,000 reduction in freight claim payments for the fiscal year." The results obtained were so remarkable that soon the \$100,000 became \$200,000, and in the first eight months of 1914-1915 claims paid amounted to only \$181,000, or 0.97 per cent of the gross revenue, and at the rate of \$9.68 per \$1,000 revenue.

The work of the development department has produced remarkable results during the period of receivership. As a result the road receives hearty co-operation from bankers and farmers on its lines, and has secured an enviable success from the standpoint of locating suitable and strong industries in the territory served by it, the development of agricultural pursuits and attracting of desirable settlers. During the year ended June 30, 1916, 328 industries were located on the Frisco, an increase of 34 over the previous year. These 328 industries employed on an average 19,627



W. C. Nixon

men, who are paid wages aggregating \$12,776,000 yearly, and who have directly dependent on them almost 1,000,000 people. During the ended June 30, 1913, 3,633 families were located with a total acreage of 466,169. In the six months ended January 1, 1914, an area equal to that of half the state of Rhode Island was taken up by farmers. The agricultural department secured its greatest success by establishing demonstration farms, and in many cases proved that the production of lands already in cultivation might be increased 75 per cent. The farms were unique in that they were not run by the railroad, but were in the hands of farmers who had been persuaded to set aside from five to ten acres of land under the direction of a Frisco demonstrator.

The reorganization of the purchasing and stores departments has resulted in marked economies in the purchase and utilization of materials.

Mr. Nixon was born in February, 1858, in Illinois, and entered railway service at the age of 20, in 1878, with the Burlington & Missouri in Nebraska. After nine months with this road he became connected with the Atchison, Topeka & Santa Fe, and was consecutively watchman, clerk, cashier, agent, chief clerk in the superintendent's office, trainmaster, material agent, division superintendent and superintendent of terminals at Chicago. From July, 1896, to January, 1897, he was general agent of the freight department, and from 1897 to January, 1900, superintendent of the Chicago division. He was then for two years general superintendent of the Gulf, Colorado & Santa Fe; from January, 1902, to June, 1904, general manager, and from June, 1904, to August 1, 1906, second vice-president and general manager of the same road. On August 1, 1906, he left the Santa Fe to become vice-president and general manager of the St. Louis & San Francisco. In May, 1911, his title was changed to vice-president in charge of maintenance and operation, which office he held until July, 1913, when he was appointed chief operating officer and receiver.

SHALL RAILWAY PROFITS BE LIMITED?*

By Geo. A. Post

President Railway Business Association.

Those who have been so enthusiastic in enacting restrictive measures to avert what they deemed the national danger that the railways *might earn too much*, little dreamed that the time would soon come when a really grave national danger would be that the railways *might not earn enough* in the public interest.

The great, crucial question pressing for solution is whether earnings are sufficient for railroad needs? Those needs are created by the demands of the growth of the country, by the demands of labor, which generally appeal to the sympathies of the public, or their fears lest transportation movements may be interrupted by strikes. These financial needs of the railway are created further by the demands of government for improvements in facilities, safety appliances, taxes, conveniences, sanitary precautions, valuation appraisals, a multiplicity of costly inspections and special reports upon a myriad incidents of operations.

When the railroads have gone to the body from which alone they may secure permission to augment their resources and plead their necessities, elaborate and long drawn-out debates have ensued as to the authority of the Interstate Commerce Commission to consider the financial results of operation in determining rate cases. The whole process of readjusting rate fabrics in the various regions has been retarded by the expressed belief of at least some of the commissioners that the commission had no authority to sanction advances for the sole purpose of increasing revenues.

Notwithstanding that lawyers of high prestige believe that the act creating the commission and those acts enlarging its powers, as interpreted by the courts already, bestow upon the commission all needed power, yet as some of the commissioners, undoubtedly honest in their convictions, reject this view the process of invigorating the roads and restoring their active development lags.

Such a dispute ought not to continue. So long as the commission doubts its power it will not act. It derives its existence and powers from Congress, of which it is an arm, and Congress can and should by statute declare the policy of the government to permit such a system of rates as will yield earnings sufficient to attract investment for improvements and extensions.

Congress would thereby in effect announce the rule fair to all railroads: "If you fail on rates which enable the average road to live and prosper you ought to fail, and the government will not protect you against failure; if on rates under which the average road can live and prosper you can earn large dividends your right is to earn them, it is in the public interest that you should earn them, and the government will protect you in their enjoyment." Public opinion brought to bear upon Congress can bring about such an enactment.

FINANCING OF PUBLIC UTILITIES

I know that many thoughtful minds are giving voice to conflicting theories regarding the proper financing of our public utilities. Some would absolutely limit all profits, while making no guarantee against loss. Some would limit profits, but guarantee a minimum dividend by the government to subscribers to stock, the government to take all above the maximum dividend allowed. The guaranteed minimum has been suggested as three per cent and the maximum as six per cent.

Such theories are repugnant to what I conceive America to be. My soul revolts at the thought that this country, the land of opportunity, the land of great risks and great rewards, shall say to investors, inventors, executives and the rank and file of workers in the railway realm: "We insure you against *failure*, but we estop you against *great success*!" If that is to be the shibboleth of America regarding its railroads, soon all enterprises of importance would be included in the propaganda. We may no longer tell our children that illimitable opportunities beckon them to a future of adventure, fortitude, courage and hard work, with risks appalling but reward possible that shall make them famous and rich.

How shall we spur on the naturally lazy and shiftless or curb the reckless if they are sure of being three per cent without determined effort or the exercise of prudence? How shall we keep blazing the fires of ambition in eager souls if naught of brilliance, indefatigable energy, thrift and self-denial can overleap the hurdle of a beggarly six per cent return for the best there is in them? How can capital be lured from its hiding places in vaults to build railroads and factories, tunnel the mountains or develop mines if the possible rewards are not commensurate with the risks? How can we raise industrial giants and inculcate intrepidity of commercial spirit on a six per cent diet?

ROAST BEEF FOR THE LIFTERS

It is no part of the function of the government to endeavor to protect the individual against failure. It cannot be done. Nothing will protect from failure the man who hasn't it in him to make good. Nothing should limit the reward of him who possesses the rare faculty for the service of mankind.

CHINESE EASTERN RAILWAY.—A settlement has been arrived at between Japan and Russia respecting the price for the purchase of the Harbin Changchun section of the Chinese Eastern Railway.

*From an address before the New York State Bankers' Association, June 9, 1916.

General News Department

President Wilson on August 29 signed the bill of lading law fixing the liability of railways for bills of lading issued by them.

Railways entering Galveston, Tex., have declared an embargo on freight for movement through Galveston by the Morgan Line steamers and the Mallory Steamship Company.

The engineers of Minnesota are attempting to bring about closer co-operation through the formation of the Minnesota Joint Engineering Board. The constituent societies represented on the board are the Northwestern Association of the members of the American Society of Civil Engineers; the Minnesota section of the American Society of Mechanical Engineers; the Minnesota section of the American Institute of Electrical Engineers; the Minnesota Surveyors' and Engineers' Society; the Engineers' Club of Minneapolis, and the Civil Engineers' Society of St. Paul. It is hoped that through this central organization the activities of the engineers of Minnesota may be more closely correlated and more accomplished for the public welfare. George W. Rathjens, of St. Paul, Minn., is the secretary of the board.

The Southern Pacific has awarded 78 gold watch fobs, suitably engraved and bearing the company's safety emblem, to employees who did the most towards furthering "safety first" work during the past fiscal year. C. H. Rippon, piecework inspector at the general shops at Sacramento, Cal., headed the list with a score of 1,293 points. Ten and one-half points are granted for each safety suggestion made involving a change in standard practice to correct a defect the practical working out of which requires actual labor, and indicates the thoughtful attention of the employee. For each suggestion which warrants the issuance of instructions to employees, but does not involve physical labor in its application, five points are given. One credit is granted for each suggestion not involving actual labor in its application, and which heretofore has been covered by instructions.

Advances in pay of 9,216 employees in transportation service, including all classes from car cleaners to superintendents, and totaling \$650,000 annually, were announced by the Brooklyn Rapid Transit Company August 30, to take effect on September 1. The new scale establishes a minimum of 34 cents

an hour and a maximum of 42½ cents an hour for motormen in subway and elevated service, as against 30 cents minimum and 40 cents maximum at the present time, but provides that the men must work ten years to receive the higher rate of pay. Conductors and motormen on the surface lines who have been receiving a minimum of 25 cents an hour and a maximum of 29 cents an hour, will hereafter be paid from 26 cents to 34 cents an hour, the maximum not to go into effect, however, until after fifteen years of service. Conductors on the elevated and subway lines who now receive from 23 to 25 cents an hour will be advanced from 26 to 28 cents an hour, and guards from 20 to 23 cents an hour to 22 and 25 cents an hour.

The Long Island's Life Saving Bulletins

The Long Island's latest attempts to prevent grade crossing accidents include the use of Life Saving Bulletins now appearing as advertisements in New York City and Long Island papers. The advertisements are about 4 by 5 in. in size. Bulletin No. 6 reads as follows: "*He smashed through the gates and stalled his engine on the tracks—*" reads the official report telling of an occurrence at one of the Long Island Railroad's grade crossings. In this case the oncoming train whirled a few inches past the automobile's mud-guards.

"Providence was kind to this reckless driver, but his existence is proof of the necessity for the manifold warnings issued to automobilists by this railroad.

"In 1915, 82 automobilists drove their cars through Long Island Railroad crossing gates, lowered to protect the public. *Stop before you cross.*"

Valuation Progress

Thomas W. Hulme, general secretary of the Presidents' Conference Committee on the federal valuation of the railroads, has issued a statement giving the progress of the field work up to July 31, 1916, as follows: From this it is noted that 73,478 miles of roadway and track have been inventoried, or less than 30 per cent of the total. The inventories of other portions of the property fall considerably below this figure.

PROGRESS OF FIELD INSPECTION, JULY 31, 1916.

Road	Date division valuation forces began work	Miles of road	Total miles inspected and inventoried to date					Total miles "adjacent similar land" inspected
			Road and track	Bridges	Buildings	Signals	Telegraph and telephone	
EASTERN GROUP								
Boston & Maine	4-29-14	2,456	2,456	2,020	2,350	2,456	2,456	2,200
Chicago & Eastern Illinois	5- 2-14	1,140	1,140	1,140	1,140	1,140	1,140	1,140
Cleveland, Cincinnati, Chicago & St. Louis	8-24-14	2,262	2,262	2,262	1,988	2,262	2,262	.....
Pennsylvania Railroad	12- 1-14	6,167	2,764	2,028	2,028	1,525	2,446	1,247
New York, New Haven & Hartford	3-31-15	2,046	1,480	927	523	...	1,004	411
Boston & Albany	4-21-15	392	392	389	392	139	392	310
Chicago, Indianapolis & Louisville	5-25-15	610	610	610	610	610	610	.....
Ann Arbor	6- 1-15	375	361	301	301	301	361	301
Chicago, Terre Haute & Southeastern	7-26-15	362	362	...	...	362	362	.....
Maine Central	8-14-15	1,147	516	341	260	154	309	297
Bangor & Aroostook	8-16-15	626	404	626	418	626	626	.....
Vandalia	8-16-15	851	791	814	80	476	805	.....
Long Island	11- 3-15	397	353	...	...	...	159	88
Philadelphia & Reading	11- 4-15	1,582	225	178	225	...	225	.....
Central Railroad of New Jersey	12- 8-15	638	301	237	237	...	638	.....
Chesapeake & Ohio	1-13-16	2,346	286	...	...	...	...	.....
Pittsburgh, Cincinnati, Chicago & St. Louis	2-28-16	1,424	648	444	397	316	1,134	.....
Pennsylvania Company	3-27-16	1,684	597	...	...	...	335	.....
New York Central (West)	4- 1-16	2,105	499	...	...	298	...	.....
Portland Terminal Railroad	4- 4-16	31	31	31	...	31	31	.....
Delaware & Hudson	5-13-16	881	114	114	114	...	...	.....
Bridgeton & Saco River	5-24-16	21	21	21	21	...	...	.....
Sandy River & Rangeley Lakes	6- 6-16	104	104	...	...	...	47	.....
Bessemer & Lake Erie	6-17-16	204	58	56	56	...	...	.....
Total to July 31		29,851	16,775	12,539	11,140	10,696	15,342	5,994
WESTERN GROUP								
Texas Midland	1-12-14	111	111	111	111	111	111	111
New Orleans, Texas & Mexico	1-22-14	173	173	173	173	173	173	173
Kansas City Southern	1-26-14	878	878	878	878	878	878	878
San Pedro, Los Angeles & Salt Lake	2-10-14	993	993	993	993	993	993	993
Elgin, Joliet & Eastern	6- 1-14	211	211	211	211	211	211	211
Western Pacific	7-24-14	984	984	984	984	984	984	984

PROGRESS OF FIELD INSPECTION, JULY 31, 1916.

Road	Date division valuation forces began work	Miles of road	Total miles inspected and inventoried to date					Total miles "adjacent similar land" inspected
			Road and track	Bridges	Buildings	Signals	Telegraph and telephone	
WESTERN GROUP (Continued)								
Quincy Western	9- 5-14	5	5	...	...	...	...	...
Missouri Southern	11- 1-14	54	54	54	54	54	54	54
Mississippi River & Bonne Terre.....	12-15-14	54	54	54	54	54	54	54
Arizona & Swansea	2- 9-15	21	21	...	...	...	...	...
United Verde & Pacific.....	3-15-15	26	26	...	...	...	...	...
Cape Girardeau & Northern	2- 1-15	106	106	106	106	106	106	...
Spokane & British Columbia.....	10-20-15	36	36	...	...	...	...	...
Butte, Anaconda & Pacific.....	10- 9-15	68	68	...	...	...	...	...
Chicago, Milwaukee & Gary.....	5-11-15	99	99	99	99	99	121	...
Trinity & Brazos Valley	12- 1-15	303	303	303	303	...	303	...
Arizona Eastern	1-28-15	398	398	398	398	None on line	371	398
St. Louis Southwestern	11-12-14	1,575	1,575	1,575	1,575	...	1,575	1,517
Texas & Pacific	11-15-15	1,851	851	352	352	...	...	...
Great Northern	5- 1-14	7,127	6,839	6,283	6,283	7,127	7,127	...
Minneapolis & Rainy River.....	5- 6-16	76	76	...	...	...	76	...
Illinois Central .....	...	...	...	...	...	...	...	...
Yazoo & Mississippi Valley.....	11-18-14	6,120	4,441	3,673	3,673	2,982	5,892	3,040
Chicago, Memphis & Gulf.....	...	...	...	...	...	...	...	...
Atchison, Topeka & Santa Fe.....	12-13-14	11,391	8,199	1,702	1,702	...	9,634	2,040
Chicago, Milwaukee & St. Paul.....	5-22-15	10,509	2,749	1,462	1,462	...	2,799	578
Southern Pacific (Pacific System).....	1- 3-15	6,935	1,838	1,313	1,313	468	5,097	1,410
Chicago, Rock Island & Pacific.....	8- 3-14	7,673	7,673	5,191	5,191	5,525	7,673	2,578
Minneapolis, St. Paul & Sault Ste. Marie.....	5- 1-14	4,177	3,149	1,409	1,409	11 Plants	2,721	1,470
Chicago & North Western.....	...	...	...	...	...	...	...	...
Chicago, St. Paul, Minneapolis & Omaha.....	9- 2-14	10,177	922	91	91	91	4,652	91
Oregon-Washington Railroad & Navigation Co.	3-30-16	2,272	690	10	10	...	...	...
Oregon Short Line.....	6- -16	2,256	...	...	...	...	...	141
Arizona Southern .....	...	22	22	...	...	...	...	...
Bullfrog Goldfield .....	...	85	85	...	...	...	...	...
Death Valley .....	...	20	20	...	...	...	...	...
Hall & Hall .....	...	1	1	...	...	...	...	...
Holton Interurban .....	...	10	10	...	...	...	...	...
Las Vegas & Tonopah.....	...	118	118	...	...	...	...	...
Montana Western .....	...	20	20	...	...	...	...	...
Montana Eastern .....	...	84	84	...	...	...	...	...
Northern Dakota .....	...	21	21	...	...	...	...	...
Pacific Coast .....	...	56	56	...	...	...	...	...
Ray & Gila Valley.....	...	9	9	...	...	...	...	...
San Diego & Arizona .....	...	46	46	...	...	...	...	...
St. John & Ophir.....	...	9	9	...	...	...	...	...
Tonopah & Goldfield.....	...	97	97	...	...	...	...	...
Tonopah & Tidewater .....	...	174	174	...	...	...	...	...
Tooele Valley .....	...	7	7	...	...	...	...	...
Riverside Rialto & Pacific.....	...	10	10	...	...	...	...	...
Farmer's Grain & Shipping Co. ....	...	53	53	...	...	...	...	...
Crandon, Devils Lake & Southern.....	...	13	13	...	...	...	...	...
Total		77,514	44,377	27,425	27,425	19,856	51,605	16,721
SOUTHERN GROUP								
Norfolk Southern	2-27-14	903	903	903	903	903	903	903
Atlanta, Birmingham & Atlantic.....	2-19-14	658	658	658	658	658	658	658
Central of Georgia.....	7- 8-14	1,972	1,972	1,972	1,972	1,972	1,972	All except terminals
Savannah & Northwestern.....	2-18-15	109	109	109	109	...	109	109
Charleston & West Carolina.....	5-29-15	341	341	341	341	...	341	286
Georgia Southern & Florida.....	1- 2-15	392	392	392	392	Unknown	Unknown	Unknown
Hawkinsville & Florida Southern.....	3- 3-15	96	96	96	96	33	Unknown	Unknown
Macon & Birmingham	1-25-15	97	97	97	97	67	Unknown	Unknown
St. Johns River Terminal.....	1-21-15	7	7	7	7	7	Unknown	Unknown
Mobile & Ohio	6-15-15	934	934	934	934	934	934	848
Southern Railway in Mississippi.....	9-15-15	292	292	292	292	292	292	292
Okolona Branch, Southern Railway.....	10-12-15	38	38	38	38	38	38	38
Southern	7-14-15	7,000	3,011	1,250	None	6,544	3,373	459
Virginian	9- 8-15	488	470	470	460	470	468	460
Winston-Salem Southbound	11-16-14	89	89	89	89	89	89	89
Nashville, Chattanooga & St. Louis.....	1- 1-16	1,230	1,230	737	1,213	1,230	152	None
Florida East Coast	9-25-15	744	744	744	744	...	744	616
Norfolk & Western	1- 3-16	2,020	238	...	...	...	...	...
Richmond, Fredericksburg & Potomac.....	1- 3-16	80	80	None	None	None	80	80
Washington Southern	2-18-16	32	32	None	None	None	32	32
Potomac, Fredericksburg & Piedmont.....	4-17-16	38	38	38	38	38	38	38
Georgia Railroad	1-15-16	307	307	307	307	307	307	All except terminals
Augusta Belt	2- 5-16	5	5	5	5	5	...	All except terminals
Augusta & Summerville	2-11-16	3	3	3	3	3	...	None
Augusta Union Station	2-10-16	1	1	...	1	...	...	None
Milledgeville Railway	2- 9-16	5	5	5	5	...	...	None
Lexington Terminal	1-14-16	3	3	...	3	...	...	3
Union Point & White Plains.....	1-14-16	12	12	...	12	12	...	12
Monroe Railroad	12-28-15	10	10	10	10	10	10	10
Danville & Western	5- 6-16	78	None	None	None	None	78	None
Virginia & Southwestern	2-24-16	210	None	None	None	23	191	None
Augusta Southern	4-19-16	83	83	83	None	83	83	None
Blue Ridge	3-25-16	34	34	None	None	34	34	None
Hartwell Railway	1-12-16	10	10	None	None	10	None	None
Lawrenceville Branch	2-18-16	10	10	None	None	10	None	None
Tallulah Falls	2-22-16	58	58	None	None	58	None	None
Carolina & Tennessee Southern.....	10- 8-15	14	14	None	None	14	14	None
Total		18,433	12,326	9,580	8,729	14,332	11,040	4,933
Total—All Roads		125,798	73,478	49,544	47,294	44,884	77,987	27,648

Mr. Mellen on the Boston & Maine Situation

C. S. Mellen, former president of the New York, New Haven & Hartford, in an interview in the Boston Post, characterizes the move for receivership of the Boston & Maine as a fight between bankrupt and leased line interests, and declares neither can afford a fight.

"The bankrupts," he said, "the same who in former years bled Boston & Maine by piling up its debt, want to take the only thing of value that remains, the leased lines, to make something they have of more value. Why should leased lines' stockholders

be asked to sacrifice a guaranteed security any more than the bondholders, who are the bankers?" He predicts that if the receivership fight is carried to the bitter end it will result in breaking up the system. "The matter ought to be patched up by friendly negotiation rather than a fight from which the public, as well as various interests financially involved, would suffer.

"The trouble has always been that fixed charges over-balanced capitalization. The dividend on its stock at 10 per cent amounts only to about \$4,000,000, and fixed charges in leased line rentals and interest on debt two or three times that.

"Charges must be reduced, but cannot be reduced with a club. Floating debt of \$13,000,000, notes which directors have announced it is inexpedient to renew, should be wiped out.

"It could be done by raising new money in stock, giving common stockholders new preferred to the amount of \$13,000,000. I believe they would subscribe to every bit of it. Leased line interests should be persuaded to accept contingent rather than guaranteed returns; to get dividends when earned.

"I do not put blame of proposed receivership on leased lines. Some rentals are exorbitant, but rentals are not too high in most cases. It would be impossible to duplicate these roads at their cost to Boston & Maine. Some could not be duplicated at 300 per cent of present capitalization.

"Hustis has made good. If New Haven had been as efficiently managed as the Boston & Maine by Mr. Hustis, New Haven would be paying 10 per cent or 12 per cent today.

"If the bankers would let Hustis alone, he would show New England something with Boston & Maine. But some day Boston & Maine's finances may go wrong, and they will try to make him the goat, as they tried to do with me.

"Boston & Maine could go on as it has for the past sixteen years. In prosperous years it would earn a dividend, but in times of depression would have a struggle to meet charges. The only way is to change those fixed charges to contingents and wipe out the debt."

General Foremen's Convention

The twelfth annual convention of the International Railway General Foremen's Association, was held at the Hotel Sherman August 29 to September 1 inclusive. L. A. North, superintendent of shops, Illinois Central, presiding. Rev. Dr. Frank W. Gunsaulus opened the convention with prayer. The association was welcomed to the city by Daniel Webster of the Prosecuting Attorney's office of the City of Chicago. Letters from various railway officers were read in which it was stated that it was impossible for them to welcome the association on account of the impending trainmen's strike. The following is a list of exhibitors at the convention:

Abrasive Company, Bridesburg, Philadelphia, Pa.—Grinding wheels. Represented by C. W. Blakeslee and J. C. Dillenbeck.

American Flexible Bolt Company, Pittsburgh, Pa.—Flexible staybolts. Represented by C. A. Seley, H. T. Frauenheim, R. W. Benson, L. W. Widmeier, Wm. Heacock, Mr. McAllister, Mr. Kenyon and Mr. Payton.

American Steel Foundries Company, Chicago.—Miniature brake beams, Simplex adjustable shelf coupler pocket, Ajax third point brake beam support and Atlas safety guard. Represented by W. C. Walsh and H. J. Melchert.

Anchor Packing Company, Chicago.—Air pump and throttle packing and power plant packings. Represented by J. O. Waterman.

Armstrong Brothers Tool Company, Chicago.—Tool holders and machine shop specialties. Represented by Joseph C. Fletcher.

Ashton Valve Company, Boston.—Safety valves, gages, gage testers and wheel press recording gages. Represented by J. W. Motherwell, F. Fetting and Joseph F. Gettrust.

Baldwin Locomotive Works, Philadelphia, Pa.—Photographs of locomotives. Represented by A. S. Goble and Charles Gaskill.

Barco Brass & Joint Co., Chicago.—Engine tender connections, air reservoir joints, car steam heat connections, roundhouse blower fittings and joints. Represented by F. N. Bard, C. L. Mellor and L. W. Millar.

Boss Nut Company, Chicago.—Represented by W. G. Willcoxson and J. W. Fogg.

Carborundum Company, Niagara Falls, N. Y.—Abrasive grinding materials. Represented by C. C. Schumaker, H. P. Frost and E. P. Ritzmar.

Celfor Tool Company, Buchanan, Mich.—Twist drills, reamers, countersinks, flue cutters and lathe tools. Represented by Mr. Montague.

Chicago Pneumatic Tool Company, Chicago.—Portable pneumatic and electric tools. Represented by J. C. Campbell and J. L. Canby.

Cleveland Twist Drill Company, Cleveland, Ohio.—Drills. Represented by Herbert White.

Crerar-Adams Company, Chicago.—Joyce-Cridland jacks. Favorite wrenches, Walstrom automatic drill chuck die starters and Desmond-Stephan grinding wheel dressers. Represented by R. W. Wallace, W. I. Clock, Arthur Martin and Geo. Bassett.

Crucible Steel Company of America, Chicago.—Represented by F. Baskerville and J. T. Stafford.

Dearborn Chemical Company, Chicago.—Literature on feed water treatment. Represented by Geo. R. Carr, I. H. Bowen, O. H. Rehmyer, F. C. Fosdick and J. H. Cooper.

Detroit Lubricator Company, Detroit, Mich.—Flange oilers of the pendulum and the ball type and bull's-eye cylinder lubricators. Represented by A. G. Machesney and Mr. Lindaman.

Detroit Twist Drill Company, Detroit, Mich.—Drills. Represented by M. F. Crawler.

Duff Manufacturing Company, Pittsburgh, Pa.—Jacks. Represented by C. N. Thulin.

Economy Devices Corporation, New York.—Casey Cavin reverse gear and the Ragonnet reverse gear. Represented by Joseph Sinkler.

Edna Brass Manufacturing Company, Cincinnati, Ohio.—Injectors, lubricators and various locomotive appliances. Represented by H. A. Glenn, J. Kirkpatrick and J. E. Jacobson.

Franklin Railway Supply Company, New York.—Franklin fire doors. Represented by H. M. Evans and C. W. F. Coffin.

Gardiner Machine Company, Beloit, Wis.—A disc grinder. Represented by E. L. Beisel and E. B. Gardiner.

Garlock Packing Company, Palmyra, New York.—Special locomotive and shop packings.—Represented by W. G. Cook and C. W. Sullivan.

Goldschmidt Thermit Company, New York.—Thermit. Represented by H. S. Mann, A. F. Beaulieu, W. Aldrich and C. D. Young.

Grip Nut Company, Chicago.—Grip nuts. Represented by W. E. Sharp, H. H. Hibbard, W. E. Fowler, Jr., and Bradley S. Carr.

Hardy, F. A., & Company, Chicago, Eye protectors and safety glasses. Represented by C. S. Wells.

Hunt-Spiller Manufacturing Company, Boston, Mass.—Cylinder and valve bushings and packing rings, piston heads, rod bushings, shoes and wedges and crosshead shoes of Hunt-Spiller gun iron. Represented by V. W. Ellet, E. J. Fuller and J. M. Monroe.

Imperial Brass Manufacturing Company, Chicago.—Oxy-acetylene welding outfit. Represented by J. Schroeter.

Independent Pneumatic Tool Company, Chicago.—Pneumatic tools. Represented by H. F. White, C. E. Mackin, J. W. Smith and H. F. Finney.

Ingersoll-Rand Company, New York.—Little David pneumatic tools. Represented by Robert C. Cole, Everett J. Welsh and Leon Schnitzer.

Jenkins Brothers, New York.—Jenkins valves. Represented by B. J. Neeley.

Keystone Equipment Company, Philadelphia, Pa.—Keystone wedge bolts, driving box, triple valve grinder and tool holders. Represented by M. R. Shafer, V. F. Shafer and F. H. Slee.

Locomotive Superheater Company, New York.—Illustrations of the superheater and instruction books on the operation and maintenance of the superheater pyrometer. Represented by J. E. Mourné.

Mahr Manufacturing Company, Minneapolis, Minn.—Rivet force, car repair torches and boiler torches. Represented by J. A. Mahr and H. B. Hazerott.

Manning, Maxwell & Moore, New York.—Ashcroft gages, Consolidated safety valves and Hancock inspirators. Represented by C. L. Brown.

Miner, W. H., Chicago.—Models of friction draft gears, safety hand brakes, side bearings, coupler yokes, center pins, etc. Represented by B. S. Johnson and J. H. Mitchell.

Mooso, C. A., Laboratories, Chicago.—Monarch tempering compound and oil of salt antiseptic. Represented by F. H. Jack.

Nathan Manufacturing Company, New York.—Non-lifting, simplex hot water injector and boiler check valve. Represented by J. S. Seeley, H. Neville and Richard Welch.

National Railway Devices Company, Chicago.—Shoemaker fire door. Represented by J. G. Robinson, E. J. Gunnison and N. M. Auerbach.

National Tube Company, Pittsburgh, Pa.—Kewanee Union and N. T. C. regrounding valve. Represented by H. Phillips and H. Weber.

Norton Company, The, Worcester, Mass.—Grinding wheels. Represented by H. K. Clark.

Ohio Injector Company, Chicago.—Injectors, lubricators, flange oilers, boiler checks, water glass protectors, hose strainers and drifting valves. Represented by Wm. S. Furry and A. C. Beckwith.

Okadee Company, Chicago.—Blow-off valves, hose couplers, reflex gages, water glasses and drain valves. Represented by A. G. Hollingshead, G. S. Turner, W. H. Heckman, Harry Vissering and M. E. Keig.

O'Malley-Bear Valve Company, Chicago.—Multiplate service system of valves. Represented by Thomas O'Malley, Edward O'Malley, Blake C. Hooper, E. A. Woodworth, William Leighton and J. N. Gallagher.

Oxweld Railroad Service Company, Chicago.—Oxy-acetylene welding and cutting apparatus. Represented by F. W. Petersen and S. R. Oldham.

Paxton-Mitchell Packing Company, Omaha, Nebr.—Model of Mitchell metallic rod packing, and Leighton balanced and lubricating piston packing rings. Represented by J. T. Luscombe.

Pilliod Company, New York.—A model of the Baker-Pilliod valve gear. Represented by F. S. Wilcoxen.

Pyle-National Company, Chicago.—Headlights, generators, and Young improved piston valves. Represented by George E. Hass, William Miller and J. Will Johnson.

Racine Tool & Machine Company, Racine, Wis.—Power hack saw. Represented by J. M. Jones.

Railway Equipment & Publication Company, New York.—Exhibiting the Pocket List of Railway Officials. Represented by C. L. Dinsmore.

Railway Review (Inc.), Chicago.—Exhibiting the Railway Review.

Rich Tool Company, Chicago.—High speed tools. Represented by R. C. Neysenburg.

Ryerson & Son, Joseph T., Chicago.—Staybolt iron. Represented by E. S. Pike and Horace Hench.

Simmons-Boardman Publishing Company, New York.—Copies of the *Railway Age Gazette* and the *Railway Mechanical Engineer*. Represented by F. H. Thompson.

Smith-Tetman Company, Chicago.—High pressure insulation. Represented by H. A. Varney.

Squire-Cogswell Company, Chicago.—Staybolts, water service supplies, rivet forges, portable burners and furnaces. Represented by W. C. Squire and C. P. Cogswell.

Street, R. R., & Company, Chicago.—Machine shop specialties and power transmission appliances. Represented by A. H. Taylor.

Union Draft Gear Company, Chicago.—Cardwell friction draft gear. Represented by H. Barnard, J. E. Farelton, J. W. Hathaway and C. J. Gorman.

United States Metallic Packing Company, Philadelphia, Pa.—Ring piston rod, valve stem and air pump packing. Represented by Morris B. Brewster and Robert R. Wells.

Vissering, Harry, Company, Chicago.—Crescent piston rod and valve stem packing, Viloco sander and Leach type sander. Represented by A. G. Hollingshead, G. S. Turner, W. H. Heckman, Harry Vissering and M. E. Keig.

Wells, R. W., Chicago.—Geometric die heads and taps, Sweetland lathe chucks, Jarvis high speed tapping devices and Hissey-Wolf electric drills and grinders. Represented by R. W. Wells.

Westinghouse Air Brake Company, Pittsburgh, Pa. Represented by A. K. Hohmyer.

Exhibitors at the Tool Foremen's Convention

The following is a list of exhibitors at the convention of the American Railway Tool Foreman's Association held at the Hotel Sherman, Chicago, August 24-26 inclusive:

Abrasive Company, Bridesburg, Philadelphia, Pa.—Grinding wheels. Represented by C. W. Blakeslee and J. C. Dillenbeck.

Allen & Co., Ltd., Edgar, Sheffield, England.—Tool steel. Represented by G. R. Bennett and F. C. Steen.

Armstrong Brothers Tool Company, Chicago.—Tool holders and machine shop specialties. Represented by Joseph C. Fletcher.

Besly & Co., Charles H., Chicago.—Besly helmet temper taps. Represented by C. A. Knill and Ralph W. Young.

Brown & Sharpe Manufacturing Company, Providence, R. I.—Cutters and tools. Represented by R. E. Doras, P. A. Topel and T. A. Day.

Brown & Co., Tom, Chicago.—Jacks, flue expanders and cutters. Represented by Tom Brown and Harry W. Standard.

Carborundum Company, Niagara Falls.—Abrasives and grinding materials. Represented by C. C. Schumaker, E. P. Ritzma and H. P. Frost.

Celfor Tool Company, Buchanan, Mich.—Twist drills, reamers, counter-sinks, flue cutters and lathe tools. Represented by Mr. Montague.

Chicago Eye Shield Company, Chicago.—eye protectors. Represented by H. J. Brennecke.

Chicago Pneumatic Tool Company, Chicago.—Portable pneumatic and electric tools. Represented by J. C. Campbell and J. L. Canby.

Cleveland Twist Drill Company, Cleveland, Ohio.—Drills. Represented by Herbert White.

Colonial Steel Company Chicago.—High grade tool steels. Represented by C. O. Sternagle.

Dale-Brewster Machinery Company, Inc., Chicago.—Cutting oils and compounds, high power hack saw, portable electric tools, drills, grinders, and Victor hack saws. Represented by James J. Dale and James W. Barbour.

Desmond-Stephan Manufacturing Company.—Complete line grinding wheel dressers. Represented by F. M. Riggs.

Detroit Twist Drill Company, Detroit, Mich.—Drills. Represented by M. F. Crammer.

Duff Manufacturing Company, Pittsburgh, Pa.—Jacks. Represented by C. N. Thulin.

Faessler Manufacturing Company, J., Moberly, Mo.—Boiler makers' tools, flue expanders and cutters. Represented by G. R. Maupin.

Galena Signal Oil Company, Franklin, Pa.—Represented by W. J. Walsh, L. Gleason, R. L. Webb, Frank Walsh and J. A. Graham.

Independent Pneumatic Tool Company.—Pneumatic tools. Represented by H. F. White, C. E. Mackin, J. W. Smith and H. F. Finney.

Ingersoll-Rand Company, New York.—Little David pneumatic tools. Represented by Robert C. Cole, Everett J. Walsh and Leon Schnitzer.

Mosso Laboratories, C. A., Chicago.—Monarch tempering compound oil of salt antiseptic. Represented by F. H. Jack.

Niles-Bement-Pond Company, Pratt & Whitney Company, Hartford, Conn.—Taps, dies, reamers and milling cutters and gages, miscellaneous small tools. Represented by John M. Howett.

Norton Company, Worcester, Mass.—Grinding wheels. Represented by H. K. Clark.

Nye Tool & Machine Works, Chicago.—Pipe dies. Represented by C. W. Nye.

Oxweld Railroad Service Company, Chicago.—Oxy-acetylene cutting and welding apparatus. Represented by F. W. Petersen and S. R. Oldham.

Racine Tool and Machine Company, Racine, Wis.—Power hack saw. Represented by J. M. Jones.

Railway Equipment & Publication Company, New York.—Exhibiting the Pocket List of Railway Officials. Represented by C. L. Dinsmore.

Rich Tool Company, Chicago.—High speed tools. Represented by R. C. Neysenburgh.

Simmons-Boardman Publishing Company, New York.—Exhibiting the *Railway Age Gazette* and the *Railway Mechanical Engineer*. Represented by F. H. Thompson.

Street & Co., R. R., Chicago.—Machine shop specialties, power transmission appliances. Represented by A. H. Taylor.

Taft-Pierce Manufacturing Company, Woonsocket, R. I.—Tool room special tools. Represented by C. O. Cromwell and E. R. Abbott.

R. W. Wells, Chicago.—Geometric die heads and taps, Sweetland lathe chucks, Jarvis high speed tapping devices, Hissey-Wolf electric drills and grinders. Represented by R. W. Wells.

Whitman & Barnes Manufacturing Company, Akron, Ohio.—Drills, wrenches, reamers and cutters. Represented by A. O. Wange and J. C. Scanlon.

Wilson-Maeulen Company, New York.—Multi-Record, Multi-Color pyrometer recorder and indicating instruments for both high and low temperatures. Represented by Otto Bersch.

Traveling Engineers' Association Convention Postponed

On account of the controversy now going on between the railroads and the four train service brotherhoods, the executive committee of the Traveling Engineers' Association has postponed the annual convention. The meeting was to have been held September 5-8. The new date will be announced later.

Railway Signal Association

In case the railway strike materializes the annual meeting of the Railway Signal Association, which it was planned to hold at the Grand Hotel, Mackinac Island, Mich., September 12-14, will be postponed until some time in October. If the strike does not take place the convention will be held as originally planned.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Annual convention, October 19-21, 1916, New Orleans, La.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, East St. Louis, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Annual meeting, October 17, 18, New Willard Hotel, Washington, D. C.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York. Annual convention, October 9-13, Atlantic City, N. J.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—H. G. McConaughy, 165 Broadway, New York. Annual convention, October 9-13, Atlantic City, N. J.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Denver, Colo.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 17-19, 1916, New Orleans, La.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 20-22, 1917, Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, San Francisco, Cal.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association. Annual convention, October 10, 1916, Waldorf-Astoria, New York.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Louisville, Ky.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, superintendent of telegraph, Indiana Harbor Belt, Gibson, Ind.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. F. Conrad, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—P. C. Jacobs, H. W. Johns-Manville Co., Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.

Traffic News

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Banff, Alberta.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, August, 1917, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May, 1917, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, August 29 to September 1, Hotel Sherman, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 17-19, Philadelphia, Pa.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dabe, B. & M., Reading, Mass. Next annual meeting, September 12-14, 1916, "The Breakers," Atlantic City, N. J.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June, 1917.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago. Next convention, March, 1917, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Annual meeting, December, 1916, New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Monongahela House, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—H. O. Hartzell, B. & O. R. R., Baltimore, Md. Next meeting, November, 1916, Chicago.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va. Annual meeting, October 3-5, 1916, New York.

RAILWAY REAL ESTATE ASSOCIATION.—Frank C. Irvine, 1125 Pennsylvania Station, Pittsburgh, Pa. Annual meeting, October 10, 1916, Chicago.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 12-14, 1916, Grand Hotel, Mackinac Island, Mich.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C, Collinwood, Ohio.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Associations.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 19-22, 1916, New York.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa. Annual meeting, October 18-20, Washington, D. C.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, October 19, 1916, Birmingham, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next meeting was to have been September 5-8, 1916, Hotel Sherman, Chicago, but postponed on account of train employees' wage controversy.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

Farmers' organizations in Nebraska have filed with the Interstate Commerce Commission complaints against the discontinuance of peddler-car service by western and northwestern lines. It is charged that discontinuance of the service gives preference to wholesale grocers and commission firms to the disadvantage of the grower and consumer.

Southwestern passenger agents are anticipating the largest passenger business in the history of roads in that section, in the event that troops are maintained upon the border through the winter, and have filed with the Interstate Commerce Commission an application to have cheap round trip rates made effective. The presence of the troops has also caused a large increase in freight traffic in the movement of equipment and supplies.

As a result of a conference of traffic heads of Texas roads held at Austin on August 22, the Texas commission rates between points in Texas will be ignored and those prescribed by the Interstate Commerce Commission in the Shreveport case observed. There seems inevitable a trial for supremacy between the Texas commission and the federal authority. When the roads begin to ignore the Texas-made rates it is anticipated the Texas commission will institute penalty suits, which the roads can prevent by federal injunctions and then compel a fighting out of the issue in the federal courts, ultimately bringing the matter again to the supreme court of the United States.

The South will be advertised as the ideal farming country at more than 25 fairs and expositions in the northern states this fall by the Southern Railway and its affiliated lines. Exhibits containing a full representation of the grains, grasses and forage crops, fruits, vegetables and miscellaneous farm and orchard products of the southern states will be displayed, and literature about the South will be distributed. A special exhibit will be moved from place to place where the county and district fairs are held, but larger exhibits will be made at the Rochester, N. Y., Exposition, September 4-9; the New York State Fair at Syracuse, September 11-16, and at the National Dairy Show, Springfield, Mass., October 12-21.

A textile directory, recently issued by the industrial and agricultural department of the Southern Railway, shows that there are 827 textile plants, with 9,865,248 spindles and 214,467 looms in operation on the lines of the Southern Railway, the Mobile & Ohio, the Georgia Southern & Florida and associated lines. The directory shows a total of 635 cotton mills, 152 knitting mills, 33 woolen mills and 7 silk mills, with eleven new textile plants under construction at the time the information was compiled. The knitting mills have 23,579 knitting machines and 2,635 sewing machines. The names and location of the different plants, with information as to equipment, power used and character of product, are given. Five-sevenths of all the spindles in the cotton growing states, and almost one-third of all the cotton spindles in the United States, are on the lines of the Southern Railway.

At a joint meeting of the Central and Western Passenger Associations, held recently at Chicago, the railroads of Illinois decided to raise passenger fares within the state from 2 cents a mile, the statutory rate, to 2.4 cents per mile. The new tariffs are now being prepared, and will be filed before September 15, to take effect 30 days thereafter. The opinion prevails that the railroads are entitled to increased rates under the recent decision of the Interstate Commerce Commission that an interstate rate of 2.4 cents between St. Louis and points in Illinois, plus a toll over the Mississippi river bridges, was a reasonable maximum, and that rates between East St. Louis and points in Illinois lower than those maintained between St. Louis and the same points were discriminatory against St. Louis. It is expected that the State Public Utilities Commission of Illinois will enjoin the increase and carry the case to the Supreme Court, if necessary.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended from August 31 to December 30 new freight tariffs filed by the transcontinental roads proposing increases in their rates to the Pacific Coast.

The Interstate Commerce Commission has suspended until December 18 proposed advances by Southwestern roads in rates on butter, eggs, dressed poultry and other commodities from points in Oklahoma and Texas to Kansas City, St. Louis and other points.

Rates on Wool from Chicago

Chicago Wool Company et al. v. Chicago, Milwaukee & St. Paul. Opinion by Commissioner Clements:

Upon complaint that the rates on wool, scoured, washed, combed, or brushed, and wool combings and wool noiles, from Chicago to points in Wisconsin, Minnesota and Iowa, which generally are any-quantity rates governed by the western classification, are unreasonable and discriminatory, the commission holds that the commodities in question should be given lower rates and ratings when in carloads than when in less than carloads. The carriers will be expected to establish promptly the carload ratings proposed by them. (40 I. C. C., 101.)

Bunker Icing Charges on Oysters

Charles Platts v. New York, New Haven & Hartford et al. Opinion by Commissioner Clark:

Effective February, March and April, 1915, defendants filed tariffs providing, in effect, that they would thereafter discontinue the absorption of bunker icing charges on shipments of oysters from the Atlantic seaboard to western points. Upon complaint that the resulting increased rates are unreasonable and discriminatory, the commission holds that the defendants have justified the increased charges on carload shipments of shucked oysters, but that the increased charges on shipments of shucked oysters in less than carloads, and of oysters in the shell in carloads, have not been shown to be reasonable. An allegation of discrimination is found not to be sustained. (39 I. C. C., 690.)

Steamer Lines from Norfolk to Baltimore, New York and Richmond.

Opinion by Commissioner Clements:

The holdings of the Southern Railway, the Chesapeake & Ohio, the Norfolk & Western, the Seaboard Air Line Railway, and the Atlantic Coast Line constitute a majority of the stock of the Old Dominion Steamship Company, which company owns all of the stock of the Virginia Navigation Company. The stock of the Chesapeake Steamship Company is owned by the Southern Railway and the Atlantic Coast Line, and that of the Baltimore Steam Packet Company by the Seaboard Air Line.

The Old Dominion Steamship Company operates a daily service in each direction between Norfolk, Va., and New York, N. Y., and between Norfolk and Richmond, Va. The Virginia Navigation Company operates a triweekly service in each direction between the latter two points and serves numerous landings on the James river. Both the Chesapeake Steamship Company and the Baltimore Steam Packet Company operate a daily service in each direction between Norfolk and Baltimore, and the former operates in addition a daily except Sunday service between West Point, Va., a point on the York River, and Baltimore.

The commission holds that the applicants may and do compete with the steamer lines in which they have an interest. It finds, however, that the present operation of the steamer lines is in the interest of the public and that the carriers, with the exception of the Norfolk & Western, may continue their interest in the water lines. In connection with the

Norfolk & Western, however, it is held that that carrier does and may compete with the Old Dominion and that the showing made by the applicant does not warrant a finding that a continuance of its participation in the operation of said company will not exclude, prevent, or reduce competition on the route by water, (41 I. C. C., 285.)

STATE COMMISSIONS

The Railroad Commission of Louisiana on September 14 will consider the adoption of Western Classification No. 54 and Supplements Numbers 1 and 2, for use on business moving between points west of the Mississippi river, and between points east of the Mississippi river, and points west of the Mississippi river.

The Railroad Commission of Louisiana will hold a hearing on September 14 to consider the amendment of the car service and demurrage rules to provide for a charge of \$1 per car per day after the expiration of free time, except during the months of October to March inclusive, when a charge of \$2 per car per day will be made.

The Railroad Commission of Louisiana will hold sessions on September 13, 1916, to consider the application of several carriers for the withdrawal from sale of interchangeable penny scrip books, form "P. S." The railroads do not believe there is any good reason why both the penny scrip books and the interchangeable individual mileage books, form "Z," should continue to be sold, and therefore agree to sell the interchangeable individual mileage books only, if the commission grants their application.

PERSONNEL OF COMMISSIONS

Ross Miller has been appointed engineer of the South Dakota Railroad Commission to succeed Joseph E. Love, resigned to go into other business.

COURT NEWS

Contributory Negligence of Child

The Michigan Supreme Court holds that a boy, 10 years old, of fair intelligence, is guilty of contributory negligence as a matter of law in attempting to crawl through a freight train, blocking a highway crossing, in reliance on its alleged custom to ring its bell before starting.—*Lahnala v. Mineral Range (Mich.)*, 158 N. W., 838.

Switchyard Accident

An engine with a water tank attached was backing through a switchyard. There was a footboard across the front of the engine, and one across the rear of the tank. Two men were stationed, one on each end of the engine footboard, so that one could look ahead on each side of the engine. In an action by a switchman for injuries received by collision with the tank, the Minnesota Supreme Court held there was no negligence in failing to have another lookout on the tank footboard.—*Beecroft v. Great Northern (Minn.)*, 158 N. W., 800.

Transportation of Liquor Into Dry Territory

In a penal action against a carrier under the Kentucky statute prohibiting the delivery of falsely marked packages of intoxicating liquor, or liquor intended for sale in "dry" territory, the Kentucky Court of Appeals holds that the carrier is liable only if its agent knew the package to be falsely marked or the purpose for which the liquor was to be used; and is not required to ascertain the purpose for which the liquor is to be used. "Knowingly," as used in the statute, means only such information as would cause a person of ordinary prudence to believe that the liquor was intended for sale contrary to law. In such an action evidence of the reputation of the consignee as an illicit vendor of intoxicating liquors is admissible; but evidence that he had a United States revenue license is inadmissible, unless accompanied by proof that the carrier's agent who made the delivery knew of such license. Knowledge of the carrier's agents at other points is insufficient.—*American Express Co. v. Commonwealth (Ky.)*, 186 S. W., 887.

Railway Officers

Executive, Financial, Legal and Accounting

William B. Biddle, who has been elected first vice-president of the St. Louis-San Francisco Railway, was born on November 12, 1856, at Beloit, Wis. He was educated at Beloit and began railway work in 1878 as a freight brakeman on the Atchison, Topeka & Santa Fe, and was later station agent on the same road. In 1882 he was appointed chief clerk in the general freight office of the Atlantic & Pacific, now a part of the Santa Fe Coast Lines, and four years later became assistant general freight agent. The next year he was appointed division freight and passenger agent of the same road, and in 1888 he was appointed assistant general freight agent of the Atchison, Topeka & Santa Fe. From 1890 to 1894 he was assistant freight traffic manager, and later was made freight traffic manager of the same road. He was elected third vice-president of the Chicago, Rock Island & Pacific on March 1, 1905, and in January, 1906, his jurisdiction was extended over the St. Louis & San Francisco, and the Chicago & Eastern Illinois. In December, 1910, when the Rock Island-Frisco properties were separated, he became vice-president of the St. Louis & San Francisco and the Chicago & Eastern Illinois, and later, with the receivership of the Frisco, Mr. Biddle was appointed one of the receivers and chief traffic officer with headquarters at St. Louis, Mo.

The St. Louis-San Francisco Railway was incorporated on August 24, to succeed the St. Louis & San Francisco and the following officers were elected: W. C. Nixon, president, as commented on elsewhere in this issue; W. B. Biddle, first vice-president; E. D. Levy, second vice-president and general manager; N. M. Rice, third vice-president and C. W. Hillard, fourth vice-president.

Operating

C. J. Kavanagh has been appointed superintendent, District 2, of the Canadian Pacific, Eastern division, with office at Montreal, Que., vice J. M. Barrett, resigned.

W. M. Bacon has been appointed general manager and acting president of the Colorado, Wyoming & Eastern, with headquarters at Laramie, Wyo., vice J. M. Herbert, resigned to accept service with another company.

J. H. Nuelle, assistant general superintendent and chief engineer of the New York, Ontario & Western at Middletown, N. Y., has been appointed general superintendent, with headquarters at Middletown, succeeding E. Canfield, deceased.

J. A. Blackburn has been appointed assistant superintendent of the Western division of the Atchison, Topeka & Santa Fe, with headquarters at Dodge City, Kan., and B. G. Krebs has been appointed acting trainmaster on the Western division, with headquarters at Dodge City.

O. R. Teague, superintendent of the Alabama division of the Seaboard Air Line at Savannah, Ga., has been appointed superintendent of the Florida division with headquarters at Tampa, vice T. W. Parsons, resigned to accept a position with another company. C. S. Patton, master mechanic at Savannah, has been

appointed superintendent of the Alabama division with headquarters at Savannah, vice Mr. Teague, and S. M. Dutton has been appointed terminal trainmaster, with headquarters at Savannah.

Traffic

Frank H. Moser has been appointed coal freight agent of the Lehigh Valley, with office at New York.

J. T. Bowe has been appointed acting freight and passenger agent of the Trinity & Brazos Valley, with headquarters at Teague, Texas, to replace John A. Hulen, granted an indefinite leave of absence.

F. W. Myers has been appointed division freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Pueblo, Colo., succeeding W. O. Skinner, and E. C. Kitching has been appointed general agent with headquarters at Atchison, Kan., succeeding Mr. Myers.

Donald Wilson, special agent in the traffic manager's office of the Long Island Railroad, has been appointed general freight agent, with headquarters at New York, and George F. Sump, chief clerk to the traffic manager, has been appointed assistant to the general freight agent.

George W. French, commercial agent, of the New York Central Fast Freight Lines, at Indianapolis, Ind., has been appointed commercial agent, with headquarters at Duluth, Minn. Vice S. J. Bigelow, deceased. Albert Stein has been appointed commercial agent, with headquarters at Indianapolis, vice Mr. French, and Kenneth A. Moore, has been appointed commercial agent, with headquarters at Cincinnati, Ohio.

A. L. Langdon, traffic manager and general freight agent of the Long Island Railroad, retired on August 31, under the pension rules of the company. The position of traffic manager has been discontinued, and the duties of that office will in future be performed by the general freight agent and the general passenger agent. Mr. Langdon was born in August, 1846, at Sugar Grove, Pa., and graduated from Randolph Academy, in June, 1863. He began railway work in November of the same year, as a clerk in the freight station of the Atlantic & Great Western, at Corry, Pa. He was promoted to agent of the same road in September, 1867, and in April, 1869, was appointed agent of the Empire Line. Five years later he was appointed soliciting agent of the Empire Line at Hagerstown, Md., and also soliciting agent of the Pennsylvania Railroad's fast local freight in September of the same year. He was promoted to general freight agent of the Cumberland Valley, at Chambersburg, Pa., in August, 1875, and in July, 1891, was transferred to Harrisburg in the same capacity. He then served as general freight agent of the Cumberland Valley and interior agent of the Great Southern Despatch at Harrisburg, Pa., and later as general freight agent and general eastern agent of the Great Southern Despatch. On June 15, 1903, Mr. Langdon was transferred to the Long Island Railroad as general freight agent, with headquarters at New York, and on February 1, 1905, he was promoted to traffic manager of the same road, from which position he now retires after nearly 53 years of continuous railway service.

M. H. Jacobs, assistant general freight agent of the Western Maryland, at Pittsburgh, Pa., has been appointed general freight agent with office at Baltimore, Md., succeeding D. G. Gray, promoted. S. J. Lamoreux, commercial freight agent at Pittsburgh, succeeds Mr. Jacobs. T. H. Fee, freight tariff agent at Baltimore,



W. B. Biddle



A. L. Langdon

has been appointed assistant general freight agent, with headquarters at Baltimore. W. S. Burton has been appointed freight tariff agent with office at Baltimore, succeeding Mr. Fee. J. A. S. Wallace, commercial freight agent at Youngstown, Ohio, has been appointed commercial freight agent at Pittsburgh, Pa., succeeding Mr. Lamoreux and J. E. Sterling, freight agent at Pittsburgh, has been appointed commercial freight agent at Youngstown, Ohio, succeeding Mr. Wallace.

Engineering and Rolling Stock

J. A. Basiner has been appointed master mechanic of the Chicago, Aurora & DeKalb, with headquarters at Aurora, Ill., to succeed William E. Jones.

L. G. Wallis has been appointed engineer of construction of the Jacksonville Terminal Company, Jacksonville, Fla., and will be in charge of the erection of the new union station at that city, which is to cost \$1,000,000.

R. E. Jackson, master mechanic of the Virginian Railway at Victoria, Va., has been appointed superintendent of motive power, with headquarters at Princeton, W. Va., vice F. T. Slayton, assigned to other duties.

Edmund Gelwix, formerly assistant engineer of the St. Louis & San Francisco, with headquarters at Springfield, Mo., has been appointed valuation engineer of the Kansas City, Clinton & Springfield with office at Springfield, Mo.

C. H. Norton, master mechanic of the Erie at Avon, N. Y., has been transferred as master mechanic to Susquehanna, Pa., and F. G. Wallace, general foreman at Dunmore, Pa., has been appointed master mechanic with office at Avon, succeeding Mr. Norton.

R. E. McCuen, assistant master mechanic of the Louisville & Nashville at West Lexington, Ky., has resigned to go into other business. B. W. Blue, mechanical foreman at West Lexington, has been appointed acting assistant master mechanic, vice Mr. McCuen. Effective September 1.

P. O. Wood, superintendent of locomotive performance of the St. Louis & San Francisco, has been appointed assistant general superintendent of motive power with headquarters at Springfield, Mo., and W. H. Malone, assistant superintendent of locomotive performance at Springfield, has been appointed superintendent of locomotive performance, succeeding Mr. Wood.

Purchasing

Hugh Greenfield has been appointed acting purchasing agent of the Duluth, Missabe & Northern, with headquarters at Duluth, Minn., succeeding Fred H. White, deceased.

THE SPANISH RAILWAY STRIKE.—The strike on the Northern Railway of Spain ended on July 20, the company agreeing to restore their posts to all men presenting themselves for duty before midnight on that date. The origin of the strike dates back to May, when the company voluntarily granted all hands a bonus of one month's pay. This was refused by the men, who demanded instead a 10 per cent increase in pay, which the company agreed to with effect from July 1. Later, further dissensions arose, the men's leaders alleging that the promised advance was in addition to the bonus, and rejecting the condition imposed by the company, that the advance should be contingent upon a continuance of prosperity. Strike notices were given, and expired on July 12, when a reduced service of trains was arranged and maintained with the aid of naval and military drivers and firemen, while the Government called upon all military reservists serving on the railways. On the 13th the Cortes were closed, and a state of siege was declared in Madrid, Barcelona and other large towns, constitutional guarantees being suspended. By the 15th, nearly all the main line mail and passenger services were being run, but goods traffic was seriously disorganized. Eventually, the Premier, Count Romanones, induced the men to submit their grievances to the Institute for Social Reforms and to return to work. The company has so far maintained its position and will give the advance previously offered while denying the men's pretended right to a fixed participation in the earnings. The outcome of the strike will be, it is said, a revision of the strike law tending to prevent stoppage of public services.

Equipment and Supplies

LOCOMOTIVES

THE PERE MARQUETTE is in the market for a number of locomotives.

THE NEW YORK, NEW HAVEN & HARTFORD has asked for prices on 28 Santa Fe type locomotives.

THE BOSTON & MAINE has ordered 2 electric locomotives from the Westinghouse Electric & Manufacturing Company for use in the Hoosac Tunnel.

FREIGHT CARS

THE CHICAGO & ALTON is reported as inquiring for 300 furniture cars.

WILSON & Co., Chicago, are in the market for 75 to 100 8,000-gal. tank cars.

THE NEW YORK CENTRAL has ordered 1,000 gondola cars from the Standard Steel Car Company.

THE MICHIGAN CENTRAL has ordered the Western Steel Car & Foundry Company to repair 500 freight cars.

THE MAHONING & SHENANGO has ordered one 36-ft. overhead line construction car from the Niles Car & Manufacturing Company.

THE ROBINSON CLAY PRODUCTS COMPANY, Chicago, has ordered 2 ore cars from the Western Steel Car & Foundry Company.

RUSSIAN GOVERNMENT.—Newman Erb, president of the Minneapolis & Saint Louis, is reported to be negotiating for the sale of a large number of second-hand box cars to the Russian Government.

PASSENGER CARS

THE NEW YORK, NEW HAVEN & HARTFORD has authorized the Osgood-Bradley Car Company to proceed with the construction of 60 coaches.

IRON AND STEEL

THE GRAND TRUNK has ordered 200 tons of bridge steel from the American Bridge Company.

THE CANADIAN PACIFIC has ordered 10,000 tons of rails from the United States Steel Corporation.

THE HAVANA CENTRAL has placed orders with the United States Steel Corporation for 10,000 tons of rails.

THE SOUTHERN RAILWAY has ordered 1,500 tons of steel from the McClintic Marshall Company for its Seneca river bridge.

THE BALTIMORE & OHIO has ordered 275 tons of steel from the American Bridge Company for a bridge at Defiance, Ohio.

THE BOSTON & MAINE has ordered 325 tons of steel from the American Bridge Company for shops at East Deerfield, Mass. It has also ordered 150 tons of bridge work from the Phoenix Bridge Works.

THE NEW YORK PUBLIC SERVICE COMMISSION for the First district will open bids on September 8 for the supply of special work for the Southern boulevard and Westchester avenue branch of the Lexington avenue subway.

MISCELLANEOUS

THE CHICAGO, BURLINGTON & QUINCY is in the market for 7,000,000 ft. of fir and other timber.

THE NORTH TEXAS & SANTA FE, a subsidiary of the Atchison, Topeka & Santa Fe, will be in the market for 320,000 cross ties, when its charter, now applied for, is granted.

Supply Trade News

The Chicago office of the Ashton Valve Company, Boston, Mass., will be located in the Transportation building on and after September 1.

Burton W. Mudge, president of Mudge & Co., Chicago, has also been elected president of the Safety First Manufacturing Company, Chicago.

Walter Chur, president and general manager of the American Railway Supply Company, New York, died Tuesday at his home in East Orange, N. J., after an illness of five months, of heart disease.

William E. Sharp, vice-president of the Grip Nut Company, Chicago, has been elected president of the company, succeeding E. R. Hibbard, retired. Howard H. Hibbard has been elected vice-president succeeding Mr. Sharp.

The Waynesboro Foundry & Machine Company, Waynesboro, Pa., is contemplating installing a new line of foundry equipment for the manufacture of a brass specialty. The company operates a brass, bronze and aluminum foundry.

W. E. Greenwood, whose appointment as assistant manager of the railway sales department of the Texas Company, with headquarters at New York, has already been announced, was born in New Orleans, La. He was educated at Roanoke College, Salem, Va., and entered railroad service in 1894 as clerk in purchasing department of the Terminal Railroad Association of St. Louis. He left there January, 1898, to accept service in purchasing department of the Missouri, Kansas & Texas at St. Louis, Mo., as voucher clerk, becoming chief clerk in 1901. He left railway business in April, 1912, to accept the position of eastern representative of the railway sales department of the Texas Company, and was later appointed assistant manager of the railway sales department as above noted.

The Selby Safety Flag Company, St. Louis, Mo., is in receipt of orders from the Chicago, Peoria & St. Louis, the Southwestern (Texas), and the Kansas City, Mexico & Orient, for improved flagmen's signal outfits.

Directors of the American Locomotive Company have declared a quarterly dividend of 1¼ per cent on the common stock. This restores the common stock to a five per cent basis and is the first dividend to be paid since August, 1908.

W. L. Hayes, formerly assistant manager of the Cleveland, Ohio, district of the American Steel & Wire Company, has been appointed manager of the Chicago district, to succeed F. C. Gedge, deceased. W. C. Stone, formerly assistant manager of the Chicago district, has been appointed manager of the Cleveland, Ohio, district to succeed Mr. Hayes.

At the recent annual meeting of the stockholders of the United States Light & Heat Corporation, Niagara Falls, N. Y., the following board of directors were elected: Egbert H. Gold, J. Allan Smith, Ralph C. Caples, Henry W. Farnum, A. Henry Ackermann, Chauncey L. Lane, Keene H. Addington, James A. Roberts, Conrad Hubert, George G. Shepard, Edwin K. Gordon. The vote of confidence in favor of the present management was 371,079 out of 425,245 votes cast.



W. E. Greenwood

C. Furness Hatley has been elected president of the National Surface Guard Company, Chicago, builders of steel surface railway cattle guards, succeeding the late James T. Hall. Mr. Hatley was born in January, 1876, at Brantford, Ont. He received his preliminary education at Sidcut School, England, from 1886 to 1889. He attended Trinity College, Port Hope, Canada, from 1889 to 1893 and Shattuck School, Fairbault, Minn., from 1894 to 1896. He then entered the banking business and was engaged in this line of endeavor until 1912 when he became interested in railway building in North Dakota. Later he became connected with the Midland Continental and remained until last February when he resigned.



C. F. Hatley

The business of the National Surface Guard Company will be considerably expanded, Mr. Hatley having already let contracts for building and materials which will permit the company to increase its output to three times its present capacity.

TRADE PUBLICATIONS

OVERHEAD CARRYING DEVICES. The New Jersey Foundry & Machine Company, New York, in catalogue 88, gives illustrations, descriptions, capacities and price lists of its line of overhead carrying devices. There are included tracking, trolleys, hoists, cranes, buckets, cars, etc.

LOCOMOTIVE CRANES.—The Brown Hoisting Machinery Company, Cleveland, Ohio, has just issued a booklet of 64 pages, which describes in detail its locomotive cranes and the various attachments which may be added for special uses. The book is illustrated with over 125 photographs showing this type of equipment engaged in a wide variety of operations.

STRUCTURAL TIMBER.—The National Lumber Manufacturers' Association has issued a 70-page book by C. E. Paul on heavy timber mill construction buildings. The book describes mill construction, and the manner in which it is built and gives information concerning the cost. The book should be of much value to those interested in this character of construction.

CHICAGO, BURLINGTON & QUINCY.—The passenger department of this company has issued two illustrated booklets describing the points of interest to the traveler in Yellowstone Park, and giving definite information as to rates, accommodations and routes. One pamphlet is a general description of the park, and the other describes the attractions of the Cody road to the park.

AMERICAN STEEL FOUNDRIES.—This company has just issued an attractive 24-page booklet entitled "Making Davis Wheels." In substance it describes a trip through the plant, viewing the processes of work on car wheels from the raw materials to the finished product. The pamphlet is not only interesting and informative, but is well printed, the illustrations being especially interesting.

TAPS AND DIES.—The Greenfield Tap & Die Corporation, Greenfield, Mass., has issued a booklet relative to the "Gun" tap which it has recently perfected and put upon the market. This tap is especially strong and efficient. Its cutting edges at the point are ground at an angle to the axis of the tap in order to cut with a shearing action. This throws the chips, unbroken, ahead of the tap instead of allowing them to collect in and clog the flutes. A two or three flute construction is thus possible and much shallower flutes are possible than in the ordinary tap. The tap may be reground again and again on the angular cutting edges and may be used until only two or three threads remain to maintain the lead. A description of the tap appeared in the Railway Mechanical Engineer for August, page 429.

Railway Construction

CHARLESTON SOUTHERN.—Seaboard Air Line.

DENVER & RIO GRANDE.—This company is building a new classification yard at Salt Lake City, Utah. There will be six tracks each 4,350 ft. long. About six miles of new tracks will be laid. The excavation, amounting to between 30,000 and 40,000 cu. yd., will be done by the company's own forces.

HILLSBOROUGH-PINELLIS INTERURBAN.—A contract has been let to make surveys, it is said, for a proposed line from Tampa, Fla., to Tarpon Springs and other points in Hillsborough county, in all, about 60 miles. M. Carabello, secretary, Tampa.

NEW YORK SUBWAYS.—Bids will be opened by the New York Public Service Commission, First district, on September 13, for the construction of Section No. 1-B of Route No. 12, a part of the Brighton Beach connection between the Fourth avenue subway and the Brighton Beach Railroad in the borough of Brooklyn.

The commission will open bids on September 8 for the installation of tracks in the Seventh avenue branch of the Seventh Avenue-Lexington Avenue Rapid Transit Railroad, from Times square in the borough of Manhattan to the Battery, and through a number of streets, and under the East river to Clark street, in the borough of Brooklyn, thence up Clark and other streets to a connection with the first subway in Brooklyn near Fulton and Joralemon streets. Bids are also wanted on the same date for the supply of special work, order No. 10 (calling for frogs and switches) for use in the construction of the Southern boulevard and Westchester avenue branch of the Lexington avenue subway.

NORTH CAROLINA ROADS.—Plans are being made to build a line from Kinston, N. C., south towards Wilmington, under a charter granted some time ago. F. I. Sutton, secretary, Kinston Chamber of Commerce, may be addressed.

RICHMOND, FREDERICKSBURG & POTOMAC.—A contract has been let to Winston & Co. for excavation work on the James River branch. The estimated cost of the work is \$150,000.

RICHMOND, RAPPAHANNOCK & NORTHERN.—Announcement is made that nearly all the money needed to insure the construction of the line from West Point, Va., northeast to Urbanna, 17 miles, has been subscribed, and it is expected that construction work will be started at once. A contract for building the line has been given to Winston & Co., Richmond. (December 24, page 1,218).

SEABOARD AIR LINE.—The Charleston Southern, building from Charleston, S. C., southwest, to Savannah, Ga., 88 miles, has track laid on 83 miles. Approaches to nearly all the bridges have been finished, and it is expected that the line will be open for business in October. The Jefferson Construction Company, Charleston, is carrying out the construction work.

SOUTHERN PACIFIC.—This company is building an extension from Crafton, Cal., to Greenspot, Cal., a distance of three miles.

SOUTHERN RAILWAY.—A contract is reported let by this company to Robert Russell, Charlotte, N. C., to build about 1.3 miles of revised line at Belmont, N. C.

TENNESSEE ROADS.—A logging line, to be between three and four miles long, will be built in Stewart county, Tenn. John K. Ferguson, Paducah, Ky., may be addressed.

WEST COAST ELECTRIC.—Rights of way are being secured, it is said, for an electric line to be built from Tampa, Fla., south via Palmetto, Bradentown, Sarasota and Bee Ridge to Venice, about 75 miles. A. E. Townsend, general manager, Sarasota.

RAILWAY STRUCTURES

BALTIMORE, MD.—The Philadelphia, Baltimore & Maryland has given a contract to the Singer-Pentz Company, Baltimore, to build a station at Edmondson avenue and Bentalou street. It will be 30 ft. by 70 ft. and will be constructed of tapestry brick

with green Spanish tile roof and composition floor. The cost of the work will be \$17,500. (August 18, p. 309.)

BELMONT, N. C.—The Southern Railway has given a contract to Robert Russell, Charlotte, N. C., it is said, to build a deck plate girder bridge over the Catawba river at Belmont.

CHARLOTTE, N. C.—Work has been started by the Seaboard Air Line on improvements, including an extension to the Charlotte passenger station. The A. M. Walkup Company, Richmond, has the contract for the work, which will be pushed to completion. (August 25, page 350.)

CORINTH, MISS.—A contract has been given to A. H. Patrick, Corinth, to build a brick station at Corinth, for the joint use of the Southern Railway and the Mobile & Ohio. The structure is to be two stories high, 50 ft. wide and 256 ft. long. The improvements will cost about \$25,000.

ELLAVILLE, GA.—The Central of Georgia is building a new freight and passenger station at Ellaville. The work is being carried out by company forces. (August 25, page 350.)

GLENN'S FERRY, IDAHO.—The Oregon Short Line will erect a 5-stall addition to its roundhouse at this point.

GRAND RAPIDS, WIS.—The W. A. Hansen Construction Company of Chippewa Falls, Wis., has been awarded a contract by the Minneapolis, St. Paul & Sault Ste. Marie for the erection of a new freight and passenger depot at this point. The estimated cost is \$45,000.

MT. HOLLY, N. C.—The Piedmont & Northern has let contracts to the Virginia Bridge & Iron Company, Roanoke, Va., for the steel work, and to Porter & Boyd, Charlotte, N. C., for the concrete foundation of a bridge, to be built over the Catawba river, at Mount Holly. There will be 2 60-ft. and 6 90-ft. deck plate girder spans. The work will cost about \$83,000.

OGDENSBURG, N. Y.—The New York Central is building, with its own forces, a pile and timber car ferry slip with a protecting stone crib, on the St. Lawrence river at Ogdensburg. The slip will be 40 ft. wide, 215 ft. long and the work will cost about \$22,000.

UNION, MISS.—Land has been secured by the Meridian & Memphis in Union, it is said, to be used as the site of a new station.

ARGENTINE-BOLIVIAN RAILWAY CONSTRUCTION.—By a decree of June 24, 1916, the Argentine Government has approved the plans and estimates prepared by the administration of state railways for the extension of the Central Norte line to the Bolivian frontier to meet the La Quiaca-Tupiza line. The plans call for the construction of 1,568 feet of track, a culvert and a stone bridge across the La Quiaca river, and an expenditure of \$30,109. This includes one-half of the cost of the bridge, as the Bolivian Government will pay the other half.

NORTH SIBERIAN RAILWAY.—A project was recently approved by the Russian Government for the construction of a privately-owned railway to serve the big timber areas of Northern Russia and the mining regions of the Northern Ural Mountains. The new line will run from Archangel, the Russian White Sea port that has come into such prominence during the present war, through Pinega, across the Urals, and through Northern Siberia to Chenshevsky on the River Ob. There will also be a branch from the Ural chain to Nadezhdinsk. The length of the line will be about 1,000 miles. Owing to the difficult nature of the region to be traversed, the estimated cost of construction is \$50,000,000.

PASSENGER CARS FOR THE AUSTRALIAN TRANSCONTINENTAL LINE.—The federal minister for home affairs is making preparations for the provision of the requisite rolling stock required for the Australian East-West Transcontinental Railway when it is opened next year. His intention was that the coaches should be wholly of steel, and a deputation was sent to the United States to study the subject. In deference to the wishes of manufacturers in Australia, the idea of securing the equipment in the United States was abandoned, and tenders are shortly to be asked for 20 cars with steel underframes. The bodies are to be of wood, as the minister recognizes that the material for all steel bodies could not be obtained in Australia.

Railway Financial News

BOSTON & MAINE.—In an interview in the Boston Post, President Hustis is quoted in part as follows:

"The reorganization committee has no new plan to offer; the leased lines have not submitted any new proposition; we have received no assurances that the noteholders would consent to another extension of the notes nor that the bankers would recommend it again. It is my personal opinion that the notes will not be extended again. I see no hope for anything but a receivership. This is no bluff nor threat.

"I am not surprised that the leased lines interests regard it as a bluff, for the notes have been extended again and again, 11 times already, I think it is, and it is only natural that they should expect another extension.

"But it is not merely a matter of extending the notes. The Boston & Maine cannot go on forever with its present unsound financial structure, nor with its physical condition as it is today. Why postpone the evil day?

"The offer of certain leased lines to accept a reduction in their fixed rentals and their proposition that they be given first preference in the stock of the new corporation were both impracticable. The former would not reduce the annual fixed charges of the system more than \$400,000 a year, and would fail to give the Boston & Maine the necessary credit. And it would be impossible to secure underwriters if the first preference stock plan were accepted."

C. W. Crooker, junior counsel for the Boston & Maine Minority Stockholders Association of Boston, is quoted as follows:

"We shall fight any such petition from the drop of the hat to the last ditch. There is no excuse for the directors' refusal to make some effort to secure a renewal of credit. The application for a receivership and a receivership are two quite different things, and the proceedings will give us a splendid opportunity to present our case."

Judge William L. Putnam, of the United States Circuit Court at Boston, on August 29, allowed an order for a temporary receivership, and appointed as receiver, President James H. Hustis.

Judge Putnam ruled that the Boston & Maine Minority Stockholders' Association was not entitled to intervene in the case. Judge Putnam also withdrew from the case because of an affidavit, which he stated attacked the integrity of the court. This bill which was filed by Asa P. French, counsel for Francis V. Streeter, of Medford, Mass., a minority stockholder, asserted that Judge Putnam's personal relations with directors of the road were so close and friendly that his decision would naturally be tinged with bias. Judge Putnam ordered the bill sent to the federal district attorney, with directions that it be placed before the grand jury for investigation.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Stockholders are to vote on September 10 on the question of taking over the Indianapolis & Louisville, the Indiana Stone Railroad and the Chicago & Wabash Valley. These companies are now subsidiaries of the Chicago, Indianapolis & Louisville.

CHICAGO, ROCK ISLAND & PACIFIC.—N. L. Amster, in the Wall Street Journal of August 25, denies emphatically that the article, "Reorganization by Anaesthesia," by Theodore Prince, mentioned in these columns in the issue of August 18, has any foundation in truth. Mr. Amster points out that the Chicago, Rock Island & Pacific is not now bankrupt in the sense of not being able to earn its fixed charges, nor ever has been.

A statement given out by the banking interests, which have been working on the plan for reorganization, is in part as follows:

The report that Speyer & Co. and Hayden, Stone & Co. have served notice that they will withdraw as underwriters of the Rock Island reorganization plan is officially denied. There have been no changes in the situation. The Prosser-Speyer-Hayden reorganization plan has received a check by the decision of Judge Geiger of Chicago allowing the Peabody committee for the railway's refunding bonds to file a

foreclosure bill. This does not imply, however, that the plan has been abandoned, and it is anticipated that the reorganization committee will oppose the Peabody committee if a foreclosure bill is filed.

CONNECTICUT RIVER RAILROAD.—Voluntary receivership for this company was sought in a petition filed in the United States Circuit Court at Boston on August 30. The Connecticut River is leased to the Boston & Maine for a period of 99 years, beginning January 1, 1893, under a 10 per cent rental agreement. See also Boston & Maine.

GRAND TRUNK.—Blair & Co., New York, who recently bought from the Grand Trunk \$2,000,000 5 per cent two-year collateral notes, are offering them at 98½, yielding about 5.80 per cent interest on the investment. The notes are secured specifically by the deposit of \$3,265,000 par value Grand Trunk 4 per cent consolidated debenture stock.

LOS ANGELES & SALT LAKE.—See San Pedro, Los Angeles & Salt Lake.

NEW YORK, NEW HAVEN & HARTFORD.—Kissel, Kinnicutt & Co., New York, are offering 4 per cent debenture bonds, due April 1, 1922, of the New York, New Haven & Hartford, at 98¼, yielding about 5 per cent interest on the investment. These bonds have been issued in exchange for the 4 per cent 15-year European loan of 1907, par for par. This issue is limited to \$27,985,000, and at present there are \$12,225,000 outstanding.

As counsel for five Massachusetts stockholders of the New Haven, Henry A. Wise began, August 30, in the United States District Court at New York, a liability and restitution suit in equity for more than \$160,000,000 against ex-officers, directors, and counsel of the New York, New Haven & Hartford. The suit is based on testimony taken at the recent Sherman law criminal prosecution in the dissolution suit, and at hearings before the Interstate Commerce Commission and various state commissions.

Plaintiffs in the suit hold New Haven stock worth \$1,250,000. They are Edwin Adams, Julius C. Morse, George C. Fisk, James F. Ray, and Mary M. Clark.

Among the defendants are: William Rockefeller, Charles M. Pratt, Lewis Cass Ledyard, George Macculloch Miller, James S. Hemingway, A. Heaton Robertson, Frederick F. Brewster, Charles F. Brooker, James S. Elton, Henry K. McHarg, Edward D. Robbins, John L. Billard, Robert W. Taft, and Charles S. Mellen, J. Pierpont Morgan, Herbert L. Satterlee. William P. Hamilton and Lewis Cass Ledyard are named defendants as executors under the will of J. Pierpont Morgan. Florence A. V. Twombly is named a defendant as executrix under the will of Hamilton McK. Twombly, deceased. The railroad company is also named as a defendant.

ST. LOUIS-SAN FRANCISCO RAILWAY.—A new company bearing this name was incorporated in Misosuri, August 24, to succeed the St. Louis & San Francisco Railroad, the properties of which were sold under foreclosure, July 19, to representatives of the reorganization managers. The authorized capital stock of the new company is \$450,000,000, of which \$200,000,000 is to be preferred and the remainder common stock.

SAN PEDRO, LOS ANGELES & SALT LAKE.—This company has changed its name to the Los Angeles & Salt Lake.

FRENCH HELMETS.—French armor steel helmets are stamped out of the best sheet steel; four pieces make up a helmet—the cap, the peak, the neck protector, and the crest; and they are riveted together and sprayed with a grey-blue paint, just sufficient to prevent rust. Each helmet requires about 2 lb. of steel and a little aluminum to stiffen the lining. Over 3,500,000 helmets have been made.

THE SUEZ CANAL.—The tonnage passing through the Suez Canal last year decreased to 4,143,340 tons, as compared with 4,767,729 tons in 1914. The revenue collected declined from \$25,000,000 in 1913 to \$24,000,000 in 1914 and \$17,000,000 in 1915. The number of ships which passed through the canal last year was 3,708 or 904 less than in 1914. The number of British vessels which used the canal in 1914 was 3,078, of an aggregate of 12,910,278 tons; in 1913, 2,736 vessels, aggregating 11,656,038 tons, passed through the waterway. The German tonnage using the canal declined from 3,352,287 tons in 1913 to 2,118,946 tons in 1914; while in 1915 there was, of course, a complete cessation of German traffic.